Congressional Budget Justification

FY 2018—Volume IV

U.S. Citizenship and Immigration Services;
Federal Law Enforcement Training Centers; Science and Technology Directorate;
and Domestic Nuclear Detection Office

Homeland Security

Department of Homeland Security

United States Citizenship and Immigration Services

Budget Overview

Fiscal Year 2018

Congressional Justification

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United States Citizenship and Immigration Services

Appropriation Organization Structure

Organization Name	Level	Fund Type (* Includes Defense Funding)
United States Citizenship and Immigration Services	**Component**	
Operations and Support	**Appropriation**	
Employment Status Verification	PPA	Discretionary - Appropriation
Procurement, Construction, and Improvements	**Appropriation**	Discretionary - Appropriation
Federal Assistance	**Appropriation**	
Citizenship and Integration Grant Program	PPA	
Immigration Examinations Fee Account	**Appropriation**	
District Operations	PPA	Mandatory - Fee
Service Center Operations	PPA	Mandatory - Fee
Asylum, Refugee and International Operations	PPA	Mandatory - Fee
Records Operations	PPA	Mandatory - Fee
Premium Processing (Including Transformation)	PPA	Mandatory - Fee
Information and Customer Services	PPA	Mandatory - Fee
Administration	PPA	Mandatory - Fee
Systematic Alien Verification for Entitlements (SAVE)	PPA	Mandatory - Fee
H-1B Nonimmigrant Petitioner Account	**Appropriation**	
Service Center Operations	PPA	Mandatory - Fee
Fraud Prevention and Detection Account	**Appropriation**	
District Operations	PPA	Mandatory - Fee
Service Center Operations	PPA	Mandatory - Fee
Asylum and Refugee Operating Expenses	PPA	Mandatory - Fee

United States Citizenship and Immigration Services
Strategic Context

Component Overview

The U.S. Citizenship and Immigration Services (USCIS) is comprised of the following mission-oriented programs that support achievement of the DHS strategic missions, goals, and objectives.

Employment Status Verification: The Employment Status Verification (E-verify) program enables authorized employers to quickly and easily verify the work authorization of their newly hired employees. E-Verify is an Internet-based system that compares information from an employee's Form I-9, Employment Eligibility Verification, to data from U.S. Department of Homeland Security and Social Security Administration records to confirm employment eligibility within seconds.

Immigration Examinations Fee Account: The Immigration Examinations Fee Account (IEFA) is the primary funding source for USCIS. Fees collected from immigration benefit applications and petitions are deposited into IEFA and are used to fund the cost of processing immigration benefit applications and associated support benefits, as well as to cover the cost of processing similar benefit requests for applicants without charge, such as refugee and asylum applicants.

H-1B Nonimmigrant Petitioner Account: The H-1B Nonimmigrant Petitioner Account supports activities related to the adjudication of employment-based petitions for nonimmigrant workers seeking an H-1B visa. This program allows U.S. employers to temporarily employ foreign workers in specialty occupations.

Fraud Prevention and Detection Account: The Fraud Prevention and Detection Account supports activities related to preventing and detecting fraud in the delivery of all immigration benefit types. The program leads efforts to identify threats to national security and public safety, detect and combat immigration benefit fraud, and remove systematic and other vulnerabilities.

Component Contributions to Achieving Departmental Missions

The table below shows the alignment of the USCIS 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	
Employment Status Verification			100%			
Immigration Examinations Fee Account			88%			12%
H-1B Nonimmigrant Petitioner Account			100%			
Fraud Prevention and Detection Account			100%			

**Totals account for rounding*

Mission 3: Enforce and Administer Our Immigration Laws

Resources Requested

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

$ in thousands

Program Name	FY 2016 Revised Enacted		FY 2017 Annualized CR		FY 2018 President's Budget	
	$	FTE	$	FTE	$	FTE
Employment Status Verification	119,671	398	116,363	398	131,513	398
Immigration Examinations Fee Account	3,170,050	13,365	3,045,961	13,110	3,706,329	15,150
H-1B Nonimmigrant Petitioner Account	15,000	-	15,000	-	15,000	-
Fraud Prevention and Detection Account	48,301	185	45,000	185	67,187	185
Total	3,353,022	13,948	3,222,324	13,693	3,920,029	15,733

Performance Measures

For *Enforce and Administer Our Immigration Laws*, two types of performance measures are presented. Strategic Measures represent USCIS 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: Average of processing cycle time (in months) for adjustment of status to permanent resident applications (I-485)						
Description: An I-485, Application to Register for Permanent Residence or Adjust Status, is filed by an individual to apply for permanent residence in the United States or to adjust their current status. This measure assesses the program's ability to meet its published processing time goals by reporting on the volume of pending applications and petitions by Center or Field Office. The Cycle Time, reflected in months (e.g. 4.0 months), measures only the pending volume in Active Pending status, deducting from Gross Pending the total volume of cases subject to customer-induced delays and Department of State visa availability, categorized as Active Suspense.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	<=4.0	<=4.0	<=4.0	<=4.0	<=4.0	<=4.0
Result:	4.7	6.0	6.4	6.9	N/A	N/A

Measure: Average of processing cycle time (in months) for naturalization applications (N-400)						
Description: An N-400, Application for Naturalization, is filed by an individual applying to become a United States citizen. This measure assesses the program's ability to meet its published processing time goals by reporting on the volume of pending applications by Center or Field Office. The Cycle Time, reflected in months (e.g. 5.0 months), measures only the pending volume in Active Pending status, deducting from Gross Pending the total volume of cases subject to customer-induced delays, categorized as Active Suspense.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	<=5.0	<=5.0	<=5.0	<=5.0	<=5.0	<=5.0
Result:	4.7	5.5	5.0	5.8	N/A	N/A

Measure: Percent of applications for citizenship and immigration benefits not approved following a potential finding of fraud						
Description: This measure reflects the agency's capacity to prevent fraud, abuse, and exploitation of the immigration system, and address systemic vulnerabilities that threaten its integrity. By not approving (denial, abandonment, withdrawal, etc.) benefits to individuals potentially attempting to commit fraud and who were not eligible for a waiver or exemptions, USCIS is actively eliminating vulnerabilities, and identifying ways to continue to deter and prevent fraud in the future. As a result, those instances where benefits are approved should be very low.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	N/A	N/A	N/A	90.0%	90.0%	90.0%
Result:	N/A	N/A	N/A	91.3%	N/A	N/A

Measure: Percent of customers satisfied with the citizenship and immigration-related support received from the National Customer Service Center						
Description: This measure gauges the overall customer rating of the support received from the National Customer Service Center. This measure is based on the results from the following areas: 1) Accuracy of information; 2) Responsiveness to customer inquiries; 3) Accessibility to information; and 4) Customer satisfaction.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	85%	85%	85%	85%	85%	85%
Result:	87%	86%	88%	85%	N/A	N/A

Measure: Percent of students enrolled in classes under the Citizenship and Integration Grant Program that show educational gains						
Description: This measure reports on the success of grant recipients to increase knowledge of English necessary for students receiving services under the program to pass the naturalization test. Under the Citizenship and Integration Grant Program, grant recipients are required to use a nationally normed standardized test of English language proficiency for student placement and assessment of progress. This measure evaluates the percentage of students receiving these services who demonstrate an increase in score						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	N/A	N/A	80%	80%	80%	80%
Result:	N/A	N/A	75%	75%	N/A	N/A

Measure: Percent of workers determined to be "Employment Authorized" after an initial mismatch						
Description: This measure assesses the accuracy of the E-verify process by assessing the percent of employment verification requests that are not positively resolved at time of initial review.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	<=1.00%	<=1.00%	<=0.90%	<=0.80%	<=0.70%	<=0.60%
Result:	0.22%	0.19%	0.17%	0.16%	N/A	N/A

Management Measures

Measure: Accuracy rate of USCIS's processing of manual verifications for Systematic Alien Verification for Entitlements (SAVE) referrals						
Description: The measure tracks the accuracy of SAVE manual verifications using a quality review which is a monthly review of verification work performed by Status Verifiers to determine whether SAVE referrals are resolved correctly. Specifically, they determine whether the response provided to by USCIS reflects the immigration status on record for persons seeking benefits from other governmental agencies using the SAVE program.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	98.0%	98.2%	98.4%	98.6%	98.8%	99.0%
Result:	99.3%	99.2%	99.1%	99.3%	N/A	N/A

Measure: Average online Citizenship Resource Center customer satisfaction rate						
Description: This measure tracks how well customers are satisfied with the Citizenship Resource Center (CRC). The CRC is a newly developed, free and easy-to-use website that helps immigrants better understand the citizenship process and gain the necessary skills required to be successful during the naturalization interview and test. It provides citizenship applicants, educators and immigrant-serving organizations with a one-stop portal for citizenship information and resources. It was established with appropriated FY2010 Immigrant Integration dollars and is the landing portal for our appropriations-funded Citizenship Public Education and Awareness Initiative.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	85%	85%	85%	85%	85%	85%
Result:	87%	84%	84%	85%	N/A	N/A

Measure: Percent of approved applications for naturalization that were appropriately decided						
Description: A N-400, Application for Naturalization, is filed by an individual applying to become a United States citizen. The USCIS conducts quality reviews on a quarterly basis to determine the accuracy rate of final decisions on approved N-400 applications. Quality reviews are conducted using a team of experienced subject matter experts. This measure assesses the program's ability to process the N-400 to provide immigration benefit services in a fully supportable and accurate manner. Additionally, the results of this quality review process are used to improve the training of adjudicators and the processes used in conducting adjudications.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	99%	99%	99%	99%	99%	99%
Result:	99%	99%	99%	99%	N/A	N/A

Measure: Percent of approved applications for permanent residence that were appropriately decided						
Description: An I-485, Application to Register for Permanent Residence or to Adjust Status, is filed by an individual to apply for permanent residence in the United States or to adjust their current status. The USCIS conducts quality reviews on a quarterly basis to determine the accuracy rate of final approved decisions. Quality reviews are conducted using a team of experienced subject matter experts. This measure assesses the program's ability to process the I-485 to provide immigration benefit services in a fully supportable and accurate manner. Additionally, the results of this quality review process are used to improve the training of adjudicators and the processes used in conducting adjudications.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	99%	99%	99%	99%	99%	99%
Result:	99%	99%	99%	99%	N/A	N/A

Mature and Strengthen Homeland Security

Resources Requested

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

$ in thousands

Program Name	FY 2016 Revised Enacted		FY 2017 Annualized CR		FY 2018 President's Budget	
	$	FTE	$	FTE	$	FTE
Immigration Examinations Fee Account	434,316	1,423	384,585	1,398	522,010	1,563
Total	434,316	1,423	384,585	1,398	522,010	1,563

Performance Measures

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

United States Citizenship and Immigration Services
Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Operations and Support	419	398	$104,560	419	398	$101,281	419	398	$108,856	-	-	$7,575
Procurement, Construction, and Improvements	-	-	$15,111	-	-	$15,082	-	-	$22,657	-	-	$7,575
Immigration Examinations Fee Account	15,828	14,788	$3,604,366	15,271	14,508	$3,430,546	17,592	16,713	$4,228,339	2,321	2,205	$797,793
H-1B Nonimmigrant Petitioner Account	-	-	$15,000	-	-	$15,000	-	-	$15,000	-	-	-
Fraud Prevention and Detection Account	185	185	$48,301	185	185	$45,000	185	185	$67,187	-	-	$22,187
Total	**16,432**	**15,371**	**$3,787,338**	**15,875**	**15,091**	**$3,606,909**	**18,196**	**17,296**	**$4,442,039**	**2,321**	**2,205**	**$835,130**
Subtotal Discretionary - Appropriation	419	398	$119,671	419	398	$116,363	419	398	$131,513	-	-	$15,150
Subtotal Mandatory - Fee	16,013	14,973	$3,667,667	15,456	14,693	$3,490,546	17,777	16,898	$4,310,526	2,321	2,205	$819,980

*Per P.L. 114-113 rescission prior to year balances (3,086) not included in FY2016 discretionary appropriation amounts.

United States Citizenship and Immigration Services
Comparison of Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$3,610,217		
Transfers & Reprogrammings	$177,121		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$3,787,338**	**$3,606,909**	**$4,442,039**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$932,664	$980,161	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$4,720,002**	**$4,587,070**	**$4,442,039**
Collections – Reimbursable Resources	$41,058	$41,058	$41,058
Total Budget Resources	**$4,761,060**	**$4,628,128**	**$4,483,097**
Obligations (Actual/Projections/Estimates)	$3,669,156	$3,647,967	-
Personnel: Positons and FTE			
Enacted/Request Positions	16,432	15,875	18,196
Enacted/Request FTE	15,371	15,091	17,296
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	15,473	15,875	18,196
FTE (Actual/Estimates/Projections)	14,547	15,091	17,296

*Per P.L. 114-113 rescission prior to year balances (3,086) not included in FY2016 discretionary appropriation amounts.

United States Citizenship and Immigration Services
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Operations and Support	419	398	$46,519	$116.88	419	398	$46,519	$116.88	419	398	$47,442	$119.2	-	-	$923	$2.32
Immigration Examinations Fee Account	15,828	14,788	$1,781,614	$120.42	15,271	14,508	$1,731,892	$119.32	17,592	16,713	$1,988,132	$118.9	2,321	2,205	$256,240	($0.42)
Fraud Prevention and Detection Account	185	185	$22,917	$123.88	185	185	$22,917	$123.88	185	185	$24,027	$129.88	-	-	$1,110	$6
Total	**16,432**	**15,371**	**$1,851,050**	**$120.37**	**15,875**	**15,091**	**$1,801,328**	**$119.31**	**18,196**	**17,296**	**$2,059,601**	**$119.03**	**2,321**	**2,205**	**$258,273**	**($0.28)**
Discretionary - Appropriation	419	398	$46,519	$116.88	419	398	$46,519	$116.88	419	398	$47,442	$119.2	-	-	$923	$2.32
Mandatory - Fee	16,013	14,973	$1,804,531	$120.46	15,456	14,693	$1,754,809	$119.38	17,777	16,898	$2,012,159	$119.02	2,321	2,205	$257,350	($0.36)

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$1,308,680	$1,274,433	$1,456,729	$182,296
11.3 Other than Full-Time Permanent	$12,085	$11,317	$13,125	$1,808
11.5 Other Personnel Compensation	$74,519	$71,950	$83,267	$11,317
12.1 Civilian Personnel Benefits	$454,902	$442,829	$505,537	$62,708
13.0 Benefits for Former Personnel	$864	$799	$943	$144
Total - Personnel Compensation and Benefits	**$1,851,050**	**$1,801,328**	**$2,059,601**	**$258,273**
Positions and FTE				
Positions - Civilian	16,432	15,875	18,196	2,321
FTE - Civilian	15,371	15,091	17,296	2,205

United States Citizenship and Immigration Services
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Operations and Support	$58,041	$54,762	$61,414	$6,652
Procurement, Construction, and Improvements	$15,111	$15,082	$22,657	$7,575
Immigration Examinations Fee Account	$1,822,752	$1,698,654	$2,240,207	$541,553
H-1B Nonimmigrant Petitioner Account	$15,000	$15,000	$15,000	-
Fraud Prevention and Detection Account	$25,384	$22,083	$43,160	$21,077
Total	**$1,936,288**	**$1,805,581**	**$2,382,438**	**$576,857**
Discretionary - Appropriation	$73,152	$69,844	$84,071	$14,227
Mandatory - Fee	$1,863,136	$1,735,737	$2,298,367	$562,630

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$38,966	$29,912	$58,767	$28,855
22.0 Transportation of Things	$12,384	$11,163	$16,768	$5,605
23.1 Rental Payments to GSA	$231,932	$242,596	$248,394	$5,798
23.2 Rental Payments to Others	$3,020	$3,257	$7,480	$4,223
23.3 Communications, Utilities, and Misc. Charges	$82,262	$84,465	$111,633	$27,168
24.0 Printing and Reproduction	$9,077	$9,798	$10,863	$1,065
25.1 Advisory and Assistance Services	$791,550	$718,791	$964,396	$245,605
25.2 Other Services from Non-Federal Sources	$188,464	$189,498	$256,960	$67,462
25.3 Other Goods and Services from Federal Sources	$261,152	$249,248	$320,992	$71,744
25.4 Operation and Maintenance of Facilities	$692	$664	$777	$113
25.7 Operation and Maintenance of Equipment	$122,647	$103,045	$148,446	$45,401
26.0 Supplies and Materials	$26,138	$29,762	$37,779	$8,017
31.0 Equipment	$109,926	$89,834	$134,163	$44,329
32.0 Land and Structures	$28,069	$21,104	$34,657	$13,553
41.0 Grants, Subsidies, and Contributions	$28,137	$20,805	$28,150	$7,345
42.0 Insurance Claims and Indemnities	$1,872	$1,639	$2,213	$574
Total - Non Pay Object Classes	**$1,936,288**	**$1,805,581**	**$2,382,438**	**$576,857**

United States Citizenship and Immigration Services
Supplemental Budget Justification Exhibits

Working Capital Fund

Dollars in Thousands

Appropriation and PPA	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget
Operations and Support	**$2,453**	**$618**	**$4,475**
Employment Status Verification	$2,453	$618	$4,475
Immigration Examinations Fee Account	**$41,660**	**$21,268**	**$24,381**
District Operations	$7,621	$3,890	$4,460
Service Center Operations	$11,355	$5,797	$6,646
Asylum, Refugee and International Operations	$11,118	$5,676	$6,506
Information and Customer Services	$5,044	$2,575	$2,952
Administration	$5,862	$2,993	$3,430
Systematic Alien Verification for Entitlements (SAVE)	$660	$337	$387
Total Working Capital Fund	**$44,113**	**$21,886**	**$28,856**

United States Citizenship and Immigration Services
Status of Congressionally Requested Studies, Reports and Evaluations

Fiscal Year	Due Date	Reference/Citation	Requirement	Status
2016	30-Jun-16	S. Rpt. 114-68	Quinquennial Report on Asylum Decision Trends and Factors - The Committee also directs USCIS and the Executive Office for Immigration Review (EOIR) to analyze and report every five years on trends and factors associated with asylum decisions made by asylum offices and officers, and immigration courts and judges, respectively. These analyses should utilize consistent methodologies over time and include statistical analysis that examines trends and associated factors in asylum outcomes, including the extent and nature of outcome variability across asylum offices and officers, and immigration courts and judges.	In Clearance

United States Citizenship and Immigration Services
Authorized/Unauthorized Appropriations

Dollars in Thousands

Budget Activity	Last year of Authorization	Authorized Level	Appropriation in Last Year of Authorization	FY 2018 President's Budget
	Fiscal Year	Amount	Amount	Amount
Operations and Support		**$631,745**	**$707,392**	**$108,856**
Employment Status Verification	2002	$631,745	$707,392	$108,856
Procurement, Construction, and Improvements		**$631,745**	**$707,392**	$22,657
Employment Status Verification – Verification Modernization Investment	2002	$631,745	$707,392	$22,657
Total Direct Authorization/Appropriation		**$631,745**	**$707,392**	**$131,513**
Immigration Examinations Fee	1988	N/A	N/A	N/A
H1-B Nonimmigrant Petitioner	1998	N/A	N/A	N/A
Fraud Prevention and Detection	2004	N/A	N/A	N/A

Note: The Immigration Examinations Fee Account was established by the 1989 DOJ Appropriations Act, Pub. L. No. 100-459 (1988); the H-1B Non-Immigrant Petitioner Fee Account was established by section 414 of the Omnibus Consolidated and Emergency Supplemental Appropriations Act, Pub. L. No. 105-277 (1998); and the Fraud Prevention and Detection Fee Account was authorized by Pub. L. No. 108-447, div. J, title IV § 426 (2004).

Discretionary Appropriation: Prior to FY 2017, USCIS's discretionary appropriation was in a single Treasury account. With the Department's Common Appropriation Structure effective FY 2017 President's Budget submission, Employment Status Verification was split by O&S and PC&I.

United States Citizenship and Immigration Services
Proposed Legislative Language

For necessary expenses for United States Citizenship and Immigration Services for operations and support of , E-Verify Program, as described in section 403(a) of the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (8 U.S.C. 1324a note), $108,856,000. For necessary expenses for the E-Verify Program for procurement, construction, of and improvements to physical and technological infrastructure to assist United States employers with maintaining a legal workforce, $22,657,000.

Language Provision	Explanation
For necessary expenses for United States Citizenship and Immigration Services for operations and support of , E-Verify Program, as described in section 403(a) of the Illegal Immigration Reform and Immigrant Responsibility Act of 1996 (8 U.S.C. 1324a note), $108,856,000.	Dollar change only. No substantial change proposed.
For necessary expenses of United States Citizenship and Immigration Services for the E-Verify Program for procurement, construction, of and improvements to physical and technological infrastructure to assist United States employers with maintaining a legal workforce, $22,657,000.	Dollar change only. No substantial change proposed.

United States Citizenship and Immigration Services
Reimbursable Resources

Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Change		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Defense - Department of Defense	**Source**	-	-	$7,500	-	-	$7,500	-	-	$7,500	-	-	-
Immigration Examinations Fee Account	Location	-	-	$7,500	-	-	$7,500	-	-	$7,500	-	-	-
District Operations	Location	-	-	$7,500	-	-	$7,500	-	-	$7,500	-	-	-
Department of Homeland Security - US Immigration and Customs Enforcement	**Source**	-	-	$12,046	-	-	$12,046	-	-	$12,046	-	-	-
Immigration Examinations Fee Account	Location	-	-	$12,046	-	-	$12,046	-	-	$12,046	-	-	-
District Operations	Location	-	-	$9,637	-	-	$9,637	-	-	$9,637	-	-	-
Records Operations	Location	-	-	$2,409	-	-	$2,409	-	-	$2,409	-	-	-
Independent Agency - Social Security Administration	**Source**	-	-	$7	-	-	$7	-	-	$7	-	-	-
Immigration Examinations Fee Account	Location	-	-	$7	-	-	$7	-	-	$7	-	-	-
Records Operations	Location	-	-	$7	-	-	$7	-	-	$7	-	-	-
Department of Homeland Security - US Customs and Border Protection	**Source**	-	-	$5,914	-	-	$5,914	-	-	$5,914	-	-	-
Immigration Examinations Fee Account	Location	-	-	$5,914	-	-	$5,914	-	-	$5,914	-	-	-
District Operations	Location	-	-	$4,731	-	-	$4,731	-	-	$4,731	-	-	-
Records Operations	Location	-	-	$1,183	-	-	$1,183	-	-	$1,183	-	-	-
Department of Justice - Department of Justice	**Source**	-	-	$250	-	-	$250	-	-	$250	-	-	-
Immigration Examinations Fee Account	Location	-	-	$250	-	-	$250	-	-	$250	-	-	-
District Operations	Location	-	-	$250	-	-	$250	-	-	$250	-	-	-
SAVE Collections	**Source**	-	-	$7,000	-	-	$7,000	-	-	$7,000	-	-	-
Immigration Examinations Fee Account	Location	-	-	$7,000	-	-	$7,000	-	-	$7,000	-	-	-
Systematic Alien Verification for Entitlements (SAVE)	Location	-	-	$7,000	-	-	$7,000	-	-	$7,000	-	-	-
Canada/UK Visa	**Source**	-	-	$8,341	-	-	$8,341	-	-	$8,341	-	-	-
Immigration Examinations Fee Account	Location	-	-	$8,341	-	-	$8,341	-	-	$8,341	-	-	-
District Operations	Location	-	-	$8,341	-	-	$8,341	-	-	$8,341	-	-	-
Total Collections		-	-	**$41,058**	-	-	**$41,058**	-	-	**$41,058**	-	-	-

Department of Homeland Security

United States Citizenship and Immigration Services

Operations and Support

Fiscal Year 2018
Congressional Justification

Table of Contents

Operations and Support

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Employment Status Verification	419	398	$104,560	419	398	$101,281	419	398	$108,856	-	-	$7,575
Total	**419**	**398**	**$104,560**	**419**	**398**	**$101,281**	**419**	**398**	**$108,856**	**-**	**-**	**$7,575**
Subtotal Discretionary - Appropriation	419	398	$104,560	419	398	$101,281	419	398	$108,856	-	-	$7,575

*Per P.L. 114-113 rescission prior to year balances (3,086) not included in FY2016 discretionary appropriation amounts.

Overview

The U.S. Citizenship and Immigration Services (USCIS) Operations and Support (O&S) appropriation encompasses the funding for ongoing mission operations, mission support, and associated management and administration (M&A) costs of the E-Verify program. O&S includes one PPA, Employment Status Verification (ESV).

ESV is one part of USCIS's identity verification program. The other is the Systematic Alien Verification for Entitlements (SAVE) program. The SAVE program is funded from mandatory fee funding within the Immigration Examinations Fee Account. The requirements for both programs are reflected in the Verification Modernization (VER MOD) initiative. The VER MOD requirements generate benefits to both programs because of the programs' similarities and sharing of the Verification Information System (VIS). As a result, the projected investment and operations and maintenance costs are distributed between the two programs.

Operations and Support
Budget Authority and Obligations
Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$104,560		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$104,560**	**$101,281**	**$108,856**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$104,560**	**$101,281**	**$108,856**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$104,560**	**$101,281**	**$108,856**
Obligations (Actual/Projections/Estimates)	$103,346	$101,281	-
Personnel: Positons and FTE			
Enacted/Request Positions	419	419	419
Enacted/Request FTE	398	398	398
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	365	419	419
FTE (Actual/Estimates/Projections)	359	398	398

*Per P.L. 114-113 rescission prior to year balances (3,086) not included in FY2016 discretionary appropriation amounts.

Operations and Support
Summary of Budget Changes
Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**419**	**398**	**$104,560**
FY 2016 Revised Enacted	**419**	**398**	**$104,560**
FY 2017 Annualized CR	**419**	**398**	**$101,281**
FY 2018 Base Budget	**419**	**398**	**$101,281**
2018 Pay Raise	-	-	$667
Annualization of 2017 Pay Raise	-	-	$256
Total, Pricing Increases	**-**	**-**	**$923**
Offset to Non-Pay	-	-	($923)
Total, Pricing Decreases	**-**	**-**	**($923)**
FY 2018 Current Services	**419**	**398**	**$101,281**
Mandatory E-Verify	-	-	$7,575
Total, Program Increases	**-**	**-**	**$7,575**
FY 2018 Request	**419**	**398**	**$108,856**
FY 2017 TO FY 2018 Change	**-**	**-**	**$7,575**

NARRATIVE EXPLANATION OF CHANGES

- **2018 Pay raise:** Increase of $671,000 for 1.9 percent pay raise.
- **Annualization of 2017 Pay Raise:** Increase of $256,000 to annualize the 2017 pay raise.
- **Offset to Non-Pay:** Decrease of $927,000 for changes in operating requirements.
- **Mandatory E-Verify:** Per the President's FY 2018 Budget Blueprint to Congress, a program enhancement of $7.575 million to begin implementation of mandatory nationwide use of the E-Verify Program.

Operations and Support
Justification of Pricing Changes

Dollars in Thousands

Pricing Changes	FY 2018 President's Budget		
	Positions	FTE	Amount
Pricing Change 1 - 2018 Pay Raise	-	-	**$667**
Employment Status Verification	-	-	$667
Pricing Change 2 - Annualization of 2017 Pay Raise	-	-	**$256**
Employment Status Verification	-	-	$256
Pricing Change 3 - Offset to Non-Pay	-	-	**($923)**
Employment Status Verification	-	-	($923)
Total Pricing Changes	-	-	-

SUMMARY OF PRICING CHANGES

- **2018 Pay raise:** Increase of $667,000 for 1.9 percent pay raise.
- **Annualization of 2017 Pay Raise:** Increase of $256,000 to annualize the 2017 pay raise.
- **Offset to Non-Pay:** Decrease of $923,000 for changes in operating requirements.

Operations and Support
Justification of Program Changes

Dollars in Thousands

Program Changes	FY 2018 President's Budget		
	Positions	FTE	Amount
Program Change 1 - Mandatory E-Verify	-	-	**$7,575**
Employment Status Verification	-	-	$7,575
Total Program Changes	-	-	**$7,575**

Program Change

Implementation of mandatory nationwide use of the E-Verify Program

Description

On March 16, 2017, the President submitted the 2018 Budget Blueprint to Congress proposing a $15.150 million increase in the base budget to begin implementation of mandatory nationwide use of the E-Verify Program. The additional $7.575 million program increase in O&S will support outreach and education activities to ensure employers are aware of the E-Verify mandate, and increased operations and maintenance for the Verification Information System to support the operation of the modernized system.

Justification

In a report submitted to Congress in June 2016, USCIS estimated that an expansion of E-Verify to nationwide mandatory use, enacted as proposed in H.R. 1147, could result in additional costs ranging from $95 million to $214 million above current cost estimates for the first four years. Actual costs incurred from the expansion of E-Verify to a nationally mandated program will depend on many factors, including, but not limited to, the requirements of the legislation for verifying employment authorization of existing employees and the number of employers that are subject to an E-Verify mandate. The proposed $15.150 million investment will enable the initial roll out of the mandatory program.

Performance

Implementation of mandatory nationwide use of the E-Verify Program will likely include the following performance enhancements:

- Removing the requirement to validate social security numbers for all E-Verify queries. The system can determine employment eligibility by validating alien numbers or U.S. passport numbers, and this change will reduce Social Security Administration's (SSA) workload. This proposal will also require SSA to modernize its secondary verification procedures to resolve mismatches.

- Remove the Form I-9, Employment Eligibility Verification, requirement for employers, with the E-Verify query record serving as proof that an employee's eligibility to work has been verified. This enhancement will help reduce the burden on employers for storing paper I-9 files.

- Allows for employers to verify their existing workforce as long as they verify all employees at the geographic location/worksite for that employer.

Operations and Support
Personnel Compensation and Benefits
Pay Summary
Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Employment Status Verification	419	398	$46,519	$116.88	419	398	$46,519	$116.88	419	398	$47,442	$119.2	-	-	$923	$2.32
Total	**419**	**398**	**$46,519**	**$116.88**	**419**	**398**	**$46,519**	**$116.88**	**419**	**398**	**$47,442**	**$119.2**	**-**	**-**	**$923**	**$2.32**
Discretionary - Appropriation	419	398	$46,519	$116.88	419	398	$46,519	$116.88	419	398	$47,442	$119.2	-	-	$923	$2.32

NARRATIVE EXPLANATION OF CHANGES

- **FTE Change FY 2017-2018:** No Change in FTE.
- **PCB Change FY 2017-2018:** Reflects a 1.9 percent increase for the 2018 pay raise and annualization of the 2017 pay raise.
- **Average Cost Change FY 2017-2018:** An average increase of $927,000 based on the pay raise calculations and annualization of FY 2017 costs.

Pay by Object Class
Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$34,770	$34,770	$35,460	$690
11.5 Other Personnel Compensation	$613	$613	$625	$12
12.1 Civilian Personnel Benefits	$11,136	$11,136	$11,357	$221
Total - Personnel Compensation and Benefits	**$46,519**	**$46,519**	**$47,442**	**$923**
Positions and FTE				
Positions - Civilian	419	419	419	-
FTE - Civilian	398	398	398	-

Operations and Support
Permanent Positions by Grade – Appropriation

Grades and Salary Range	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
Total, SES	1	1	1	-
GS-15	32	32	32	-
GS-14	108	108	108	-
GS-13	69	69	69	-
GS-12	39	39	39	-
GS-11	47	47	47	-
GS-10	1	1	1	-
GS-9	73	73	73	-
GS-7	42	42	42	-
GS-6	2	2	2	-
GS-5	5	5	5	-
Total Permanent Positions	**419**	**419**	**419**	**-**
Unfilled Positions EOY	54	419	419	-
Total Perm. Employment (Filled Positions) EOY	365	-	-	-
Position Locations				
Headquarters	181	181	181	-
U.S. Field	238	238	238	-
Averages				
Average Personnel Costs, ES Positions	159,205	160,797	163,852	3,055
Average Personnel Costs, GS Positions	90,298	92,194	93,946	1,752
Average Grade, GS Positions	12	12	12	-

Operations and Support
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Employment Status Verification	$58,041	$54,762	$61,414	$6,652
Total	**$58,041**	**$54,762**	**$61,414**	**$6,652**
Discretionary - Appropriation	$58,041	$54,762	$61,414	$6,652

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$152	$118	$133	$15
22.0 Transportation of Things	$5	$5	$6	$1
23.1 Rental Payments to GSA	$3,569	$4,293	$4,382	$89
23.2 Rental Payments to Others	$51	$47	$53	$6
23.3 Communications, Utilities, and Misc. Charges	$41	$38	$43	$5
24.0 Printing and Reproduction	$10	$9	$10	$1
25.1 Advisory and Assistance Services	$34,711	$32,174	$36,359	$4,185
25.2 Other Services from Non-Federal Sources	$677	$628	$710	$82
25.3 Other Goods and Services from Federal Sources	$9,583	$8,883	$10,038	$1,155
25.7 Operation and Maintenance of Equipment	$8,026	$7,440	$8,407	$967
26.0 Supplies and Materials	$68	$63	$71	$8
31.0 Equipment	$1,148	$1,064	$1,202	$138
Total - Non Pay Object Classes	**$58,041**	**$54,762**	**$61,414**	**$6,652**

Employment Status Verification – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Employment Status Verification	419	398	$104,560	419	398	$101,281	419	398	$108,856	-	-	$7,575
Total	**419**	**398**	**$104,560**	**419**	**398**	**$101,281**	**419**	**398**	**$108,856**	**-**	**-**	**$7,575**
Subtotal Discretionary - Appropriation	419	398	$104,560	419	398	$101,281	419	398	$108,856	-	-	$7,575

Employment Status Verification – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$104,560		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$104,560**	**$101,281**	**$108,856**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$104,560**	**$101,281**	**$108,856**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$104,560**	**$101,281**	**$108,856**
Obligations (Actual/Projections/Estimates)	$103,346	$101,281	-
Personnel: Positons and FTE			
Enacted/Request Positions	419	419	419
Enacted/Request FTE	398	398	398
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	365	419	419
FTE (Actual/Estimates/Projections)	359	398	398

Employment Status Verification – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**419**	**398**	**$104,560**
FY 2016 Revised Enacted	**419**	**398**	**$104,560**
FY 2017 Annualized CR	**419**	**398**	**$101,281**
FY 2018 Base Budget	**419**	**398**	**$101,281**
2018 Pay Raise	-	-	$667
Annualization of 2017 Pay Raise	-	-	$256
Total, Pricing Increases	**-**	**-**	**$923**
Offset to Non-Pay	-	-	($923)
Total, Pricing Decreases	**-**	**-**	**($923)**
FY 2018 Current Services	**419**	**398**	**$101,281**
Mandatory E-Verify	-	-	$7,575
Total, Program Increases	**-**	**-**	**$7,575**
FY 2018 Request	**419**	**398**	**$108,856**
FY 2017 TO FY 2018 Change	**-**	**-**	**$7,575**

PPA Description

The Employment Status Verification PPA provides funds for the operations, mission support, and associated management and administration costs of E-Verify – the program that provides employment authorization status verification to employers. E-Verify is an internet-based program that enables an employer to determine a newly-hired employee's eligibility to work in the United States by verifying information reported on an employee's Form I-9 against DHS, Social Security Administration, Department of State, and Department of Motor Vehicle data from participating states. As of September 30, 2016, there were 678,297 employers enrolled in E-Verify who ran more than 34 million queries.

The table below provides a detailed breakout of FY 2018 planned spending.

Description of Funding	O & S
Pay and Benefits	**$47,442,000**
General Operating Expenditures	**$8,404,000**
Total Contracts	**$53,010,000**
Secondary Reimbursement to Social Security (SSA)	*$7,547,000*
Verification Information System O&M	*$12,893,066*
Self Check (my E-Verify)	*$2,022,000*
Customer Relationship Management	*$3,500,000*
Telephony – Contact Center	*$4,236,000*
Data Analytics	*$0*
Records and Information from DMVs for E-Verify (RIDE)	*$1,610,000*
Outreach and Education	*$9,330,000*
Other Contracts/Technical Contract Support	*$11,871,934*
Total	**$108,856,000**

The FY 2018 Budget will support the projected level of activity outlined in the table below. FY 2016 actuals and FY 2017 and FY 2018 projections are provided for comparison.

E-Verify	**FY 16 Actuals**	**FY 17**	**FY 18**
E-Verify Cases	34,206,349	35,898,058	37,600,361
E-Verify cases requiring secondary review by USCIS staff	443,482	394,879	413,604
E-Verify cases requiring additional review by USCIS staff	58,539	39,488	41,360
Records and Information for DMVs for E-Verify Queries*	3,042,692	3,342,692	3,642,692
Employers (Cumulative)	678,297	749,451	814,666
E-Verify Monitoring & Compliance Staff	**FY 16 Actuals**	**FY 17**	**FY 18**
On-Board	72	78	78
Vacancies	6	-	-
Payroll Expenditures	5,903,163	6,028,557	6,125,035
Monitoring & Compliance	**FY 16 Actuals**	**FY 17**	**FY 18**
Emails	102,933	128,545	170,761
Compliance Calls	3,130	3,588	4,126
Desk Reviews	26	405	466
Site Visits	33	30	50
Enhanced Compliance Assistance	275	225	281
Webinars	0	19	44
Total Employer Actions	**106,397**	**132,812**	**175,728**
External Actions	**FY 16 Actuals**	**FY 17**	**FY 18**
Referrals to Immigration and Customs Enforcement (Fraud)	4	22	25
Referrals to Department of Justice (Discrimination)	625	640	736
Law Enforcement Requests (LERs)	255	302	347
Referrals from DOJ (Immigrant and Employee Rights Misuse and Abuse Report Referrals)	12	10	15
Locked Social Security Numbers (SSNs)	28	240	50
Total External Activity	**924**	**1,214**	**1,174**

* Wisconsin joined the E-Verify RIDE Program in FY 2016, bringing the total number of participating states to seven .

This PPA also includes funding for the E-Verify Monitoring and Compliance Branch.

Monitoring and Compliance Branch*
($ in Thousands)

FY 2016 Actuals	FY 2017 Estimate	FY 2018 President's Budget
$5,903	$6,029	$6,125

**The amounts provided in the table only represent salaries and benefits of staff in the Monitoring and Compliance Branch.*

Adjustments to Base Justification

The FY 2018 Budget includes the following adjustments to base:

- Increase of $671,000 for 1.9 percent pay raise
- Increase of $256,000 to annualize of the 2017 pay raise
- Decrease of $927,000 for changes in operating requirements

Employment Status Verification-PPA
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Employment Status Verification	419	398	$46,519	$116.88	419	398	$46,519	$116.88	419	398	$47,442	$119.2	-	-	$923	$2.32
Total	**419**	**398**	**$46,519**	**$116.88**	**419**	**398**	**$46,519**	**$116.88**	**419**	**398**	**$47,442**	**$119.2**	**-**	**-**	**$923**	**$2.32**
Discretionary - Appropriation	419	398	$46,519	$116.88	419	398	$46,519	$116.88	419	398	$47,442	$119.2	-	-	$923	$2.32

NARRATIVE EXPLANATION OF CHANGES

FY 2018 request estimates $567,360 for performance awards. This request remains in line with OPM Awards Guidance on spending limitation.

FTE Change FY 2017-2018: No Change in FTE.

PCB Change FY 2017-2018: Reflects a 1.9 percent increase for the 2018 pay raise and annualization of the 2017 pay raise.

Average Cost Change FY 2017-2018: An average increase of $927,000 based on the pay raise calculations and annualization of FY 2017 costs.

Employment Status Verification- PPA
Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$34,770	$34,770	$35,460	$690
11.5 Other Personnel Compensation	$613	$613	$625	$12
12.1 Civilian Personnel Benefits	$11,136	$11,136	$11,357	$221
Total - Personnel Compensation and Benefits	**$46,519**	**$46,519**	**$47,442**	**$923**
Positions and FTE				
Positions - Civilian	419	419	419	-
FTE - Civilian	398	398	398	-

Pay Cost Drivers

Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Salaries and Benefits	398	$46,519	$117	398	$46,519	$117	398	$47,446	$119	0	$927	$2
Total – Pay Cost Drivers	**398**	$46,519	$117	398	$46,519	$117	398	$47,446	$119	**0**	**$927**	**$2**

Employment Status Verification – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Employment Status Verification	$58,041	$54,762	$61,414	$6,652
Total	**$58,041**	**$54,762**	**$61,414**	**$6,652**
Discretionary - Appropriation	$58,041	$54,762	$61,414	$6,652

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$152	$118	$133	$15
22.0 Transportation of Things	$5	$5	$6	$1
23.1 Rental Payments to GSA	$3,569	$4,293	$4,382	$89
23.2 Rental Payments to Others	$51	$47	$53	$6
23.3 Communications, Utilities, and Misc. Charges	$41	$38	$43	$5
24.0 Printing and Reproduction	$10	$9	$10	$1
25.1 Advisory and Assistance Services	$34,711	$32,174	$36,359	$4,185
25.2 Other Services from Non-Federal Sources	$677	$628	$710	$82
25.3 Other Goods and Services from Federal Sources	$9,583	$8,883	$10,038	$1,155
25.7 Operation and Maintenance of Equipment	$8,026	$7,440	$8,407	$967
26.0 Supplies and Materials	$68	$63	$71	$8
31.0 Equipment	$1,148	$1,064	$1,202	$138
Total - Non Pay Object Classes	**$58,041**	**$54,762**	**$61,414**	**$6,652**

Employment Status Verification – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Verification Information System (VIS) Contract	$18,145	$2,417	$5160	$2743
Verification Information System (VIS) Modernization	$12,670	$4,464	$4,464	$0
Social Security Administration Reimbursements	$6,500	$4,441	$4,441	$0
Rental Payments to GSA	$4,550	$4,293	$4,382	$89
Outreach and Education	$2,985	$1,755	$5,575	$3,820
Other Costs	$13,191	$37,392	$37,392	$0
Total – Non Pay Cost Drivers	**$58,041**	**$54,762**	**$61,414**	**$6,652**

NARRATIVE EXPLANATION OF CHANGES

- **Verification Information System Contract:** This cost is for all day-to-day operations and application maintenance to fully maintain VIS, such as managing software configuration; conducting corrective, adaptive, or relevance maintenance; maintaining VIS operational readiness, system administration activities, technical service support, database administration, and ad-hoc reporting.
- **Verification Information System Modernization:** A portion of funding supports modernization of Verification systems, including the VIS and its associated business processes and applications through a series of agile software development and releases.
- **Social Security Administration (SSA) Reimbursements:** This cost is to reimburse SSA for all E-Verify queries that cannot be resolved electronically. These costs are dependent upon query volume.
- **Rental Payments to GSA:** The FY 2018 amount is based on projections developed by USCIS's Facilities Division, using information provided by GSA and reflects projected rent increases, termination of leases, and new leases.
- **Outreach and Education:** The FY 2018 amount is based upon need to provide additional information regarding the E-Verify mandate.

Department of Homeland Security

United States Citizenship and Immigration Services

Procurement, Construction, and Improvements

Fiscal Year 2018
Congressional Justification

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Procurement, Construction, and Improvements
Budget Comparison and Adjustments
Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Verification Modernization (VER)	$15,111	$15,082	$22,657	$7,575
Total	**$15,111**	**$15,082**	**$22,657**	**$7,575**
Discretionary - Appropriation	$15,111	$15,082	$22,657	$7,575

Overview

The U.S. Citizenship and Immigration Services (USCIS) Procurement, Construction, and Improvements (PC&I) appropriation funds the planning and acquisition costs for the E-Verify program, which helps U.S. employers ensure they have a legal workforce by providing employment authorization status verification of their recently hired employees. The PC&I appropriation helps ensure the integrity of the immigration system through strengthening and modernizing the infrastructure supporting the E-Verify program. PC&I includes one PPA, Employment Status Verification (ESV).

Note: PC&I encompasses the funding for planning and acquisition that is presented in the Verification Modernization investment business case; funding for operations and maintenance that is presented in the Verification Modernization investment business case is included in the USCIS Operations and Support appropriation.

Procurement, Construction, and Improvements
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$15,111		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$15,111**	**$15,082**	**$22,657**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$15,111**	**$15,082**	**$22,657**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$15,111**	**$15,082**	**$22,657**
Obligations (Actual/Projections/Estimates)	$15,111	$15,082	-
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE Including Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

PPA DESCRIPTION

The Employment Status Verification PPA provides funds for the planning and acquisition costs for E-Verify – the program through which USCIS provides employment authorization status verification to employers. E-Verify is an internet-based program that enables an employer to determine a newly-hired employee's eligibility to work in the United States by verifying information reported on an employee's Form I-9 against DHS, Social Security Administration, Department of State, and Department of Motor Vehicle data from participating states. As of September 30, 2016, there were 678,297 employers enrolled in E-Verify and they ran more than 34 million queries. The program continues to grow by approximately 1,300 new employers per week.

USCIS requires $22.7 million, 0 Positions, and 0 Full-Time Equivalents (FTE) in this PPA. FY 2018 funding will provide:

- Updates and enhancements to Verification Information Systems (VIS) through a series of agile software releases and development to improve business workflows and functionality, while improving system scalability and accuracy, to support the E-Verify and SAVE programs.
- Current Services also includes a $7.6 million increase for Verification Modernization (VER MOD) to begin implementing mandatory nationwide use of E-Verify.

Procurement, Construction, and Improvements
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$15,111**
FY 2016 Revised Enacted	**-**	**-**	**$15,111**
FY 2017 Annualized CR	**-**	**-**	**$15,082**
FY 2018 Base Budget	**-**	**-**	**$15,082**
Mandatory E-Verify	-	-	$7,575
Total Investment Elements	**-**	**-**	**$7,575**
FY 2018 Current Services	**-**	**-**	**$22,657**
FY 2018 Request	**-**	**-**	**$22,657**
FY 2017 TO FY 2018 Change	**-**	**-**	**$7,575**

NARRATIVE EXPLANATION OF CHANGES

The FY 2018 request proposes a $15.2 million increase in the base budget to begin implementation of mandatory nationwide use of the E-Verify Program. The additional $7.6 million program increase in the Verification Modernization investment will support system design enhancements, including enhanced authentication technology, as part of the initial roll-out of a mandatory nationwide program.

Procurement, Construction, and Improvements
Non Pay Budget Exhibits

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
25.1 Advisory and Assistance Services	$15,111	$15,082	$22,657	$7,575
Total - Non Pay Object Classes	**$15,111**	**$15,082**	**$22,657**	**$7,575**

Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Verification Modernization Development	$15,111	$15,082	$22,657	$7,575
Total – Non Pay Cost Drivers	$15,111	$15,082	$22,657	$7,575

NARRATIVE EXPLANATION OF CHANGES

Contract/Verification Modernization Development: The PC&I account provides funding to support modernization of Verification systems, including the Verification Information System and its associated business processes and applications through a series of agile software development and releases. Additional funds in the FY 2018 Budget will support system design enhancements for implementation of mandatory nationwide program usage.

Procurement, Construction, and Improvements
Capital Investments Exhibits

Capital Investments

Dollars in Thousands

Investment	Unique Item Identifier	Acquisition Level	Procurement / Construction	IT/Non-IT	MAOL	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget
Verification Modernization (VER)	024-000003029	2	Procurement	IT	Yes	$15,111	$15,082	$22,657

Verification Modernization (VER) – Investment

Capital Investments Exhibits

Procurement/Acquisition Programs

(Verification Modernization)
Procurement, Construction, and Improvements Funding

Investment	Unique Item Identifier	Acquisition Level	Procurement / Construction	IT/Non-IT	MAOL	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget
Verification Modernization (VER)	024-000003029	2	Procurement	IT	Yes	$15,111	$15,082	$22,657

Investment Description

The USCIS Verification Modernization (VER MOD) investment aims to strengthen and improve E-Verify and SAVE to support continued workload growth by modernizing the Verification Information System (VIS) and associated applications. The E-Verify program allows participating employers to verify the employment eligibility of newly hired employees, while the SAVE program allows federal, state and local government agencies to verify the immigration status of benefit applicants. Modernization will streamline and automate business processes, strengthen the technical infrastructure of VIS, and increase the capacity of both E-Verify and SAVE, while reducing the risk of identity fraud, data inaccuracies, and system misuse.

Justification

Funding is required to support the VER MOD acquisition investment in accordance with the Acquisition Program Baseline (APB). Adhering to the established APB will enable USCIS to meet the Key Performance Parameters (KPPs) and achieve Full Operational Capability (FOC) in third quarter of FY 2020. Failure to fund the program will delay the modernization effort and could result in a program breach. VER MOD program is fully funded in accordance with the annually updated Life Cycle Cost Estimate (LCCE).

FY 2016 Key Milestone Events (Prior Year)

- Mobile E-Verify application completed
- VIS Modernization Pilot completed

FY 2017 Planned Key Milestone Events (Year of Execution)

- Achieve Initial Operational Capability for Verification Modernization Program
- Modernize the Enrollment process for E-Verify
- Continue system migration to the Cloud to improve system performance and availability

FY 2018 Planned Key Milestone Events (Budget year)

- Deliver E-Verify and SAVE algorithm improvements to reduce cases requiring human intervention
- Improve system scalability of the VIS to support a mandatory E-Verify environment
- Continue refactoring and simplifying the system architecture to reduce system maintenance costs

Overall Investment Funding

	Prior Years	FY 2016	FY 2017	FY 2018
Operations and Support		$ 104,560	$101,281	$108,856
Procurement, Construction, and Improvements		$15,111	$15,082	$22,657
Project Funding		$119,671	$116,363	$131,513
Obligations			$39,636	
Expenditures		$ 118,475	$28,908	

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value
CIAIRWA15079-0001	Excella	Interagency Reimbursable Working Agreement (IRWA)	9/15	10/15	9/16	No	$11,100
CISIRWA16079-0000	Excella	Interagency Reimbursable Working Agreement (IRWA)	9/16	9/16	9/17	No	$15,300

Significant Changes to Investment since Prior Year Enacted

- The FY 2018 request proposes a $15.2 million increase in the base budget to begin implementation of mandatory nationwide use of the E-Verify Program. The additional $7.6 million program increase in the Verification Modernization investment will support system design enhancements for implementation of mandatory nationwide program usage.

Investment Schedule

Description	Design Work		Project Work	
	Initiated	Completed	Initiated	Completed
	FY 2016			
The VIS pilot will focus on addressing the USCIS Verification program's key capability gaps through an agile, incremental delivery approach. The pilot will introduce latest advances in software development concepts and continuous delivery techniques in rapid application development, and deploy capability in frequent iterations. This effort focuses on enhancing business process and analytic functions and automating infrastructure provisioning based on an extensible architecture that is flexible, scalable, and designed to adapt to rapidly growing workload volume and evolving user needs. This pilot initiative will play a significant role in determining the roadmap for future enhancements, assessing technical feasibility, reducing IT infrastructure costs, and mitigating risks associated with future system improvement activities.			FY 2015: Q4	FY 2016: Q4
Drive the modernization of E-Verify User Enrollment and Tutorials via agile software development and Cloud engineering, and deploy interactive content that will guide users of companies through the E-Verify enrollment process.			FY 2016: Q2	FY 2016: Q4
	FY 2017			
Build and deploy new web applications, analyze the current database, extract, modernize data tier components, and improve algorithms for optimal systems functionality.			FY 2016: Q4	FY 2017: Q4
Continue system migration to the Cloud to improve system performance and availability			FY 2016: Q4	FY 2017: Q4
	FY 2018			
Deliver E-Verify and SAVE algorithm improvements to reduce cases requiring human intervention.			FY 2017: Q4 (Planned)	FY 2018: Q4 (Planned)
Continue refactoring and simplifying the system architecture to reduce system maintenance costs.			FY 2017: Q4 (Planned)	FY 2018: Q4 (Planned)

Department of Homeland Security

United States Citizenship and Immigration Services

Immigration Examinations Fee Account

Fiscal Year 2018
Congressional Justification

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Immigration Examinations Fee Account

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
District Operations	7,778	7,276	$1,590,552	7,630	7,249	$1,615,409	8,311	7,895	$1,756,407	681	646	$140,998
Service Center Operations	3,539	3,352	$599,010	3,846	3,654	$669,891	3,556	3,378	$649,461	(290)	(276)	($20,430)
Asylum, Refugee and International Operations	1,606	1,447	$284,231	1,381	1,312	$259,042	1,668	1,585	$399,882	287	273	$140,840
Records Operations	396	360	$129,368	359	341	$124,177	430	408	$135,477	71	67	$11,300
Premium Processing (Including Transformation)	447	419	$436,637	-	-	$226,380	1,430	1,359	$620,829	1,430	1,359	$394,449
Information and Customer Services	317	299	$97,932	360	342	$124,041	329	313	$109,445	(31)	(29)	($14,596)
Administration	1,522	1,423	$434,316	1,472	1,398	$384,585	1,645	1,563	$522,010	173	165	$137,425
Systematic Alien Verification for Entitlements (SAVE)	223	212	$32,320	223	212	$27,021	223	212	$34,828	-	-	$7,807
Total	**15,828**	**14,788**	**$3,604,366**	**15,271**	**14,508**	**$3,430,546**	**17,592**	**16,713**	**$4,228,339**	**2,321**	**2,205**	**$797,793**
Subtotal Mandatory - Fee	15,828	14,788	$3,604,366	15,271	14,508	$3,430,546	17,592	16,713	$4,228,339	2,321	2,205	$797,793

Overview

The Immigration Examinations Fee Account (IEFA), established by Section 286 of the Immigration and Nationality Act (8 U.S.C. 1356), is the primary funding source for U.S. Citizenship and Immigration Services (USCIS). Fees collected with the submission of immigration benefit applications and petitions are deposited into the IEFA and are used to fund the cost of processing immigration benefit applications and petitions, as well as to cover the cost of processing similar benefit requests for applicants without charge, for example, for refugee and asylum applicants. The IEFA provides resources for USCIS to:

- Strengthen and effectively administer the immigration system;
- Strengthen national security safeguards and combat fraud;
- Reinforce quality and consistency in administering immigration benefits; and
- Enhance customer service and public engagement.

For FY 2018, the Immigration Examinations Fee Account includes the following PPAs:

- District Operations
- Service Center Operations
- Asylum, Refugee and International Operations
- Records Operations
- Premium Processing (Including Transformation)
- Information and Customer Service:
- Administration
- Systematic Alien Verification for Entitlements (SAVE)

Immigration Examinations Fee Account
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$3,430,546		
Transfers & Reprogrammings	$173,820		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$3,604,366**	**$3,430,546**	**$4,228,339**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$932,664	$980,161	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$4,537,030**	**$4,410,707**	**$4,228,339**
Collections – Reimbursable Resources	$41,058	$41,058	$41,058
Total Budget Resources	**$4,578,088**	**$4,451,765**	**$4,269,397**
Obligations (Actual/Projections/Estimates)	$3,490,556	$3,471,604	-
Personnel: Positons and FTE			
Enacted/Request Positions	15,828	15,271	17,592
Enacted/Request FTE	14,788	14,508	16,713
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	14,946	15,271	17,592
FTE (Actual/Estimates/Projections)	13,997	14,508	16,713

Immigration Examinations Fee Account
Collections – Reimbursable Resources

Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Defense - Department of Defense	Source	-	-	$7,500	-	-	$7,500	-	-	$7,500
Department of Homeland Security - US Immigration and Customs Enforcement	Source	-	-	$12,046	-	-	$12,046	-	-	$12,046
Independent Agency - Social Security Administration	Source	-	-	$7	-	-	$7	-	-	$7
Department of Homeland Security - US Customs and Border Protection	Source	-	-	$5,914	-	-	$5,914	-	-	$5,914
Department of Justice - Department of Justice	Source	-	-	$250	-	-	$250	-	-	$250
SAVE Collections	Source	-	-	$7,000	-	-	$7,000	-	-	$7,000
Canada/UK Visa	Source	-	-	$8,341	-	-	$8,341	-	-	$8,341
Total Collections		-	-	**$41,058**	-	-	**$41,058**	-	-	**$41,058**

Immigration Examinations Fee Account
Summary of Budget Changes
Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**15,271**	**14,508**	**$3,430,546**
USCIS FY16 Reprogramming	557	280	$173,820
Total Above Threshold Reprogrammings/Transfers	**557**	**280**	**$173,820**
FY 2016 Revised Enacted	**15,828**	**14,788**	**$3,604,366**
FY 2017 Annualized CR	**15,271**	**14,508**	**$3,430,546**
FY 2018 Base Budget	**15,271**	**14,508**	**$3,430,546**
2018 Pay Raise	-	-	$27,803
Annualization of 2017 Pay Raise	-	-	$9,319
Workload Adjustment	2,178	2,069	$717,256
Workload Adjustment - Executive Orders	143	136	$43,415
Total, Pricing Increases	**2,321**	**2,205**	**$797,793**
Total Adjustments-to-Base	**2,321**	**2,205**	**$797,793**
FY 2018 Current Services	**17,592**	**16,713**	**$4,228,339**
FY 2018 Request	**17,592**	**16,713**	**$4,228,339**
FY 2017 TO FY 2018 Change	**2,321**	**2,205**	**$797,793**

Immigration Examinations Fee Account
Justification of Pricing Changes

Dollars in Thousands

Pricing Changes	FY 2018 President's Budget		
	Positions	FTE	Amount
Pricing Change 1 - 2018 Pay Raise	**-**	**-**	**$27,803**
District Operations	-	-	$13,364
Service Center Operations	-	-	$5,062
Asylum, Refugee and International Operations	-	-	$2,619
Records Operations	-	-	$576
Premium Processing (Including Transformation)	-	-	$1,998
Information and Customer Services	-	-	$496
Administration	-	-	$3,382
Systematic Alien Verification for Entitlements (SAVE)	-	-	$306
Pricing Change 2 - Annualization of 2017 Pay Raise	**-**	**-**	**$9,319**
District Operations	-	-	$4,651
Service Center Operations	-	-	$1,847
Asylum, Refugee and International Operations	-	-	$898
Records Operations	-	-	$200
Premium Processing (Including Transformation)	-	-	$268
Information and Customer Services	-	-	$181
Administration	-	-	$1,161
Systematic Alien Verification for Entitlements (SAVE)	-	-	$113
Pricing Change 3 - Workload Adjustment	**2,178**	**2,069**	**$717,256**
District Operations	538	510	$100,195
Service Center Operations	(290)	(276)	($27,339)
Asylum, Refugee and International Operations	287	273	$120,446
Records Operations	71	67	$10,524
Premium Processing (Including Transformation)	1,430	1,359	$388,433
Information and Customer Services	(31)	(29)	($15,273)
Administration	173	165	$132,882
Systematic Alien Verification for Entitlements (SAVE)	-	-	$7,388
Pricing Change 4 - Workload Adjustment - Executive Orders	**143**	**136**	**$43,415**
District Operations	143	136	$22,788
Asylum, Refugee and International Operations	-	-	$16,877
Premium Processing (Including Transformation)	-	-	$3,750
Total Pricing Changes	**2,321**	**2,205**	**$797,793**

SUMMARY OF PRICING CHANGES

- ***2018 Pay Raise***: Total increase for all PPAs of $27.803 million to factor in 1.9% pay increase in FY 2018.
- ***Annualization of 2017 Pay Raise*:** Total increase for all PPAs of $9.319 million for annualization of 2017 pay raise.
- ***Workload Adjustment:*** Total increase across all PPAs of 2,178 positions, 2,069 Full Time Equivalents (FTE) and $717.256 million for changes in operational requirements.
- ***Workload Adjustments Attributable to Executive Orders:*** Total increase across all PPAs of 143 positions, 136 FTE and $43.415 million for changes in operational requirements attributable to Executive Orders on border security and immigration enforcement and protecting the Nation from foreign terrorist entry into the United States.

Immigration Examinations Fee Account
Personnel Compensation and Benefits
Pay Summary
Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
District Operations	7,778	7,276	$843,896	$115.98	7,630	7,249	$838,791	$115.71	8,311	7,895	$955,811	$121.07	681	646	$117,020	$5.36
Service Center Operations	3,539	3,352	$411,093	$122.64	3,846	3,654	$438,433	$119.99	3,556	3,378	$362,144	$107.21	(290)	(276)	($76,289)	($12.78)
Asylum, Refugee and International Operations	1,606	1,447	$183,755	$126.68	1,381	1,312	$161,411	$122.72	1,668	1,585	$187,281	$117.87	287	273	$25,870	($4.85)
Records Operations	396	360	$36,734	$102.04	359	341	$34,301	$100.59	430	408	$41,222	$101.03	71	67	$6,921	$0.44
Premium Processing (Including Transformation)	447	419	$45,484	$108.55	-	-	-	-	1,430	1,359	$142,460	$104.83	1,430	1,359	$142,460	$104.83
Information and Customer Services	317	299	$32,177	$107.62	360	342	$35,731	$104.48	329	313	$35,484	$113.37	(31)	(29)	($247)	$8.89
Administration	1,522	1,423	$206,691	$144.96	1,472	1,398	$201,441	$143.81	1,645	1,563	$241,869	$154.44	173	165	$40,428	$10.63
Systematic Alien Verification for Entitlements (SAVE)	223	212	$21,784	$102.75	223	212	$21,784	$102.75	223	212	$21,861	$103.12	-	-	$77	$0.37
Total	**15,828**	**14,788**	**$1,781,614**	**$120.42**	**15,271**	**14,508**	**$1,731,892**	**$119.32**	**17,592**	**16,713**	**$1,988,132**	**$118.9**	**2,321**	**2,205**	**$256,240**	**($0.42)**
Mandatory - Fee	15,828	14,788	$1,781,614	$120.42	15,271	14,508	$1,731,892	$119.32	17,592	16,713	$1,988,132	$118.9	2,321	2,205	$256,240	($0.42)

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

Immigration Examinations Fee Account
Pay by Object Class
Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$1,257,607	$1,223,360	$1,404,183	$180,823
11.3 Other than Full-Time Permanent	$12,030	$11,262	$13,067	$1,805
11.5 Other Personnel Compensation	$72,941	$70,372	$81,623	$11,251
12.1 Civilian Personnel Benefits	$438,172	$426,099	$488,316	$62,217
13.0 Benefits for Former Personnel	$864	$799	$943	$144
Total - Personnel Compensation and Benefits	**$1,781,614**	**$1,731,892**	**$1,988,132**	**$256,240**
Positions and FTE				
Positions - Civilian	15,828	15,271	17,592	2,321
FTE - Civilian	14,788	14,508	16,713	2,205

Immigration Examinations Fee Account
Permanent Positions by Grade Appropriation

Grades and Salary Range	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
Total, SES	73	73	73	-
Total, EX	1	1	1	-
GS-15	860	830	956	126
GS-14	1,887	1,821	2,098	277
GS-13	2,973	2,868	3,304	436
GS-12	4,183	4,034	4,656	622
GS-11	1,113	1,073	1,237	164
GS-10	16	16	18	2
GS-9	2,389	2,304	2,655	351
GS-8	26	25	29	4
GS-7	1,482	1,429	1,647	218
GS-6	314	303	349	46
GS-5	504	487	561	74
GS-4	6	6	7	1
GS-3	1	1	1	-
Total Permanent Positions	**15,828**	**15,271**	**17,592**	**2,321**
Unfilled Positions EOY	1,203	-	-	-
Total Perm. Employment (Filled Positions) EOY	14,625	15,271	-	-15,271
Position Locations				
Headquarters	2,304	2,223	2,561	338
U.S. Field	13,460	12,984	14,958	1,974
Foreign Field	64	64	73	9
Averages				
Average Personnel Costs, ES Positions	173,251	176,889	180,250	3,361
Average Personnel Costs, GS Positions	83,040	84,784	86,395	1,611
Average Grade, GS Positions	11	11	11	-

Immigration Examinations Fee Account
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
District Operations	$746,656	$776,618	$800,596	$23,978
Service Center Operations	$187,917	$231,458	$287,317	$55,859
Asylum, Refugee and International Operations	$100,476	$97,631	$212,601	$114,970
Records Operations	$92,634	$89,876	$94,255	$4,379
Premium Processing (Including Transformation)	$391,153	$226,380	$478,369	$251,989
Information and Customer Services	$65,755	$88,310	$73,961	($14,349)
Administration	$227,625	$183,144	$280,141	$96,997
Systematic Alien Verification for Entitlements (SAVE)	$10,536	$5,237	$12,967	$7,730
Total	**$1,822,752**	**$1,698,654**	**$2,240,207**	**$541,553**
Mandatory - Fee	$1,822,752	$1,698,654	$2,240,207	$541,553

Immigration Examinations Fee Account
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$38,387	$29,480	$57,963	$28,483
22.0 Transportation of Things	$12,343	$11,114	$16,668	$5,554
23.1 Rental Payments to GSA	$224,627	$234,518	$240,195	$5,677
23.2 Rental Payments to Others	$2,931	$3,164	$7,329	$4,165
23.3 Communications, Utilities, and Misc. Charges	$82,214	$84,419	$111,573	$27,154
24.0 Printing and Reproduction	$9,065	$9,787	$10,849	$1,062
25.1 Advisory and Assistance Services	$710,715	$642,953	$860,383	$217,430
25.2 Other Services from Non-Federal Sources	$184,320	$186,020	$250,776	$64,756
25.3 Other Goods and Services from Federal Sources	$250,953	$239,669	$309,477	$69,808
25.4 Operation and Maintenance of Facilities	$692	$664	$777	$113
25.7 Operation and Maintenance of Equipment	$114,621	$95,605	$140,039	$44,434
26.0 Supplies and Materials	$25,191	$29,132	$36,599	$7,467
31.0 Equipment	$108,615	$88,581	$132,559	$43,978
32.0 Land and Structures	$28,069	$21,104	$34,657	$13,553
41.0 Grants, Subsidies, and Contributions	$28,137	$20,805	$28,150	$7,345
42.0 Insurance Claims and Indemnities	$1,872	$1,639	$2,213	$574
Total - Non Pay Object Classes	**$1,822,752**	**$1,698,654**	**$2,240,207**	**$541,553**

District Operations - PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
District Operations	7,778	7,276	$1,590,552	7,630	7,249	$1,615,409	8,311	7,895	$1,756,407	681	646	$140,998
Total	**7,778**	**7,276**	**$1,590,552**	**7,630**	**7,249**	**$1,615,409**	**8,311**	**7,895**	**$1,756,407**	**681**	**646**	**$140,998**
Subtotal Mandatory - Fee	7,778	7,276	$1,590,552	7,630	7,249	$1,615,409	8,311	7,895	$1,756,407	681	646	$140,998

District Operations - PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$1,615,409		
Transfers & Reprogrammings	($24,857)		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$1,590,552**	**$1,615,409**	**$1,756,407**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$1,590,552**	**$1,615,409**	**$1,756,407**
Collections – Reimbursable Resources	$30,459	$30,459	$30,459
Total Budget Resources	**$1,621,011**	**$1,645,868**	**$1,786,866**
Obligations (Actual/Projections/Estimates)	$1,579,698	$1,645,868	-
Personnel: Positons and FTE			
Enacted/Request Positions	7,778	7,630	8,311
Enacted/Request FTE	7,276	7,249	7,895
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	7,460	7,630	8,311
FTE (Actual/Estimates/Projections)	6,933	7,249	7,895

District Operations - PPA
Collections – Reimbursable Resources

Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Defense - Department of Defense	Source	-	-	$7,500	-	-	$7,500	-	-	$7,500
Department of Homeland Security - US Immigration and Customs Enforcement	Source	-	-	$9,637	-	-	$9,637	-	-	$9,637
Department of Homeland Security - US Customs and Border Protection	Source	-	-	$4,731	-	-	$4,731	-	-	$4,731
Department of Justice - Department of Justice	Source	-	-	$250	-	-	$250	-	-	$250
Canada/UK Visa	Source	-	-	$8,341	-	-	$8,341	-	-	$8,341
Total Collections		**-**	**-**	**$30,459**	**-**	**-**	**$30,459**	**-**	**-**	**$30,459**

District Operations – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**7,630**	**7,249**	**$1,615,409**
USCIS FY16 Reprogramming	148	27	($24,857)
Total Above Threshold Reprogrammings/Transfers	**148**	**27**	**($24,857)**
FY 2016 Revised Enacted	**7,778**	**7,276**	**$1,590,552**
FY 2017 Annualized CR	**7,630**	**7,249**	**$1,615,409**
FY 2018 Base Budget	**7,630**	**7,249**	**$1,615,409**
2018 Pay Raise	-	-	$13,364
Annualization of 2017 Pay Raise	-	-	$4,651
Workload Adjustment	538	510	$100,195
Workload Adjustment - Executive Orders	143	136	$22,788
Total, Pricing Increases	**681**	**646**	**$140,998**
Total Adjustments-to-Base	**681**	**646**	**$140,998**
FY 2018 Current Services	**8,311**	**7,895**	**$1,756,407**
FY 2018 Request	**8,311**	**7,895**	**$1,756,407**
FY 2017 TO FY 2018 Change	**681**	**646**	**$140,998**

PPA Description

USCIS requires $1.756 billion, 8,311 Positions, and 7,895 Full-Time Equivalents (FTE) to sustain mission critical services in this PPA.

The District Operations PPA includes the following offices that help process immigration benefit applications and help maintain processing time goals while ensuring the security and integrity of the immigration system.

Field Operations

The Field Operations Directorate conducts in-person interviews for all immigration and naturalization benefit types that require an interview. The most significant benefits are adjustment of status applications to become a permanent resident and naturalization applications to become a U.S. citizen.

Fraud Detection and National Security

The Fraud Detection and National Security Directorate (FDNS) leads USCIS efforts to determine whether individuals or organizations requesting immigration benefits pose a threat to national security, public safety, or the integrity of the Nation's immigration system. They do this by detecting, deterring, and administratively investigating immigration-related fraud, and working to eliminate systemic vulnerabilities that could present a threat to national security and public safety.

FDNS' Case Management System records, tracks, and manages immigration inquiries, investigative referrals, law enforcement requests, and case determinations involving benefit fraud, criminal activity, public safety and national security concerns. FDNS processed over 119,000 cases in FY 2016 and projects to complete nearly 120,000 cases in FY 2017 and more than 133,000 cases in FY 2018. The increase in workload is attributable to the impact of the Executive Orders, "Implementing the President's Border Security and Immigration Enforcement Policies" and "Protecting the Nation from Foreign Terrorist Entry into the United States."

Fraud Detection Referrals Processed[1]

FY 2016 (Actual)	Projected FY 2017	Projected FY 2018
119,434	119,987	133,303

Source: Fraud Detection and National Security Data System.

Of the 119,434 referrals FDNS received in FY 2016[2]:

- 5,870 were national security concerns.
- 2,527 were public safety leads and 13,907 were public safety cases.
- 22,624 were fraud leads and 21,620 were fraud cases.
- 40,156 were requests for assistance.
- 1,398 were requests for overseas verification.
- 11,332 were requests for benefit fraud assessments.

Office of Information Technology

The Office of Information Technology (OIT) provides the information technology, equipment, software, services, expertise, and the strategic vision to enable USCIS to deliver effective, efficient, and secure immigration services and products. OIT leads USCIS in the design, development, delivery, and deployment of a wide range of IT services and solutions that are collectively improving the Nation's immigration system.

[2] For the purpose of this document, the term "referral" indicates any request for FDNS to review, investigate, or support USCIS workload. This differs from the standard definition of FDNS-DS "referral" that does not include requests to FDNS to conduct administrative investigations of fraud.
[2]Case type and subtype data is provided as of October 19, 2015. FDNS-DS is an active system. Cases may be created, deleted, converted, or merged at any time.

Biometrics

The Biometrics Division is responsible for collecting biometric and biographic data from applicants that are required to provide this data when requesting immigration benefits in the United States.

Biometrics Workload

The following table depicts FY 2016 actual workload volumes and projected FY 2017 and FY 2018 workload volumes for the USCIS Biometrics program, which entails applicant/petitioner processing at the Application Support Centers (ASCs) nationwide, as well as fingerprint checks and name checks with the Federal Bureau of Investigation (FBI). When required by USCIS, applicants and petitioners appear at an ASC to have their biometrics (fingerprints, photographs, and signatures) collected. The biometrics are used for identity verification purposes, as well as for performing the FBI checks for security purposes. USCIS reimburses the FBI for the costs of these security checks. The biometrics workload is a derivative of immigration benefit application and petition receipts.

	FY 2016 Actual	FY 2017 Projected	FY 2018 Projected
Individuals Processed at an ASC	3,546,528	3,560,604	3,526,020
FBI Fingerprint Checks	3,785,047	4,148,615	3,964,331
FBI Name Checks	2,113,530	2,151,106	2,173,223

Office of Citizenship

The Office of Citizenship promotes the rights, responsibilities, and importance of U.S. citizenship and provides educational tools and resources for immigrants, organizations, and other stakeholders.

From FY 2009 through FY 2016, USCIS has awarded 308 competitive grants totaling approximately $63 million. Since the inception of the program, grant recipients have provided citizenship preparation services to more than 156,000 permanent residents in 37 states and the District of Columbia. In FY 2017, services will be provided to an additional 25,000 permanent residents.

The table depicts FY 2016 Citizenship and Integration Grant Program output and outcome data along with projected FY 2017 and FY 2018 program outputs and outcomes.

Accomplishments	FY 2016 Actual	FY 2017 Projected	FY 2018 Projected
Grants awarded	46	46	46
Monitoring visits conducted	17	17	17
Total permanent residents served	34,230	30,000	30,000
Total students enrolled in citizenship classes	14,502	13,000	13,000
Total clients provided with naturalization eligibility screenings	23,324	20,000	20,000
Total N-400 applications for naturalization submitted to USCIS	16,185	15,000	15,000
Total permanent residents that became naturalized citizens	8,591	9,000	9,000

Office of Performance and Quality

The Office of Performance and Quality (OPQ) seeks to preserve and enhance the quality of USCIS data by serving as diligent stewards of the data. Through the use of sound data collection, validation, and management techniques, and by ensuring a high degree of data quality, OPQ provides relevant and actionable datasets to USCIS.

Application and Petition Workload

The following table depicts FY 2016 immigration benefit application and petition workload, including requests received, requests approved, and requests not approved. It also provides receipt projections for FY 2017 along with USCIS's planned completions, i.e., how many cases will be processed in FY 2017. USCIS assumes similar levels of receipts for FY 2018.

		Fiscal Year 2016				Fiscal Year 2017	
		[1]Requests Received	[2]Requests Approved	[3]Requests Not Approved	[4]Total Completions	[10] Receipt Projection	[9]Completion Target
Total - All Forms		**8,708,503**	**7,248,610**	**1,260,178**	**8,508,788**	**8,466,456**	**9,211,989**
Family-Based							
I-129F	Fiancé(e) Petitions	52,885	47,898	7,558	55,456	52,135	46,485
I-130	Immediate and Preference Relatives	869,292	692,219	59,496	751,715	576,882	663,355
I-485	Family-Based Adjustments	338,013	278,523	31,662	310,185	329,461	431,555
I-600/600A	Orphan Petitions	3,200	3,407	501	3,908	3,526	2,880
I-601A	Provisional Waivers	51,213	33,291	6,792	40,083	67,959	2,880
I-751	Remove Conditions on Residence	144,648	134,288	8,096	142,384	157,684	193,478
I-800/800A	Convention Country Adoptions	8,353	8,218	207	8,425	8,792	7,365
I-129	Nonimmigrant Worker Petitions	509,636	480,161	96,791	576,952	499,747	656,394
I-140	Immigrant Petitions for Workers	147,581	130,761	8,724	139,485	155,612	176,971
I-485	Employment-Based Adjustments	128,858	110,406	6,888	117,294	124,360	125,263
I-526	Petitions by Entrepreneurs	14,147	7,632	1,735	9,367	15,799	29,608
[5]I-765	Employment Authorization Documents	2,111,906	1,833,171	116,573	1,949,744	2,270,280	2,203,216
I-829	Remove Conditions on Entrepreneur	3,474	1,758	96	1,854	3,859	8,124
I-924	Regional Center Applications	436	265	64	329	1,713	1,422
Humanitarian							
I-485	Asylum Adjustments	35,857	38,077	1,473	39,550	34,748	47,731
I-485	Refugee Adjustments	66,220	61,123	1,269	62,392	69,848	81,185
I-485	Indo Chinese Adjustments	-	-	-	-	-	1
I-485	Cuban Adjustment Act	61,273	53,547	1,982	55,529	57,877	72,056
I-589	Asylum Application	115,888	9,538	131	9,669	135,550	43,215
[6]Legalization	Legalization/ SAW	116	53	144	197	125	642
I-730	Refugee/Asylee Relative Petitions	13,708	14,135	3,020	17,155	13,544	18,165

		Fiscal Year 2016				Fiscal Year 2017	
		[1]Requests Received	[2]Requests Approved	[3]Requests Not Approved	[4]Total Completions	[10] Receipt Projection	[9]Completion Target
I-817	Family Unity Applications	916	1,168	90	1,258	944	902
I-821	Temporary Protected Status	302,611	187,521	7,336	194,857	67,984	202,977
I-821D	Deferred Action for Childhood Arrivals	260,725	199,084	14,724	213,808	453,596	411,846
I-867	Credible Fear Referral	94,048	-	-	-	100,000	100,000
I-881	NACARA 203 Applications	642	595	81	676	304	304
I-889	Reasonable Fear	9,632	-	-	-	11,037	11,037
I-914	T Nonimmigrant Status Applications	1,848	1,736	357	2,093	1,973	2,769
I-918	U Nonimmigrant Status Applications	60,710	17,937	3,161	21,098	65,609	22,374
I-929	Petitions for Family of U Nonimmigrants	1,084	761	73	834	1,244	1,873
Naturalization							
N-300	Declaration of Intent	31	37	-	24	18	22
N-336	Requests for Hearing	4,851	2,706	2,057	4,763	5,000	5,772
N-400	Military Naturalization	8,678	8,606	653	9,259	9,643	9,223
N-400	Non-Military Naturalization	963,475	744,166	85,368	829,534	843,649	1,000,646
N-470	Preserve Residence for Naturalization	202	158	113	271	206	196
N-565	Replace Naturalization/Citizenship Certifica	27,486	28,889	5,276	34,165	27,954	25,463
N600/600K	Recognition of Citizenship Applications	71,236	64,795	5,737	70,532	65,551	75,820
N-644	Posthumous Naturalization	N	-	-	-	-	2
N-648	Disability Exception Applications	8,496	11,253	6,475	17,728	8,452	18,297

		Fiscal Year 2016				Fiscal Year 2017	
		[1]Requests Received	[2]Requests Approved	[3]Requests Not Approved	[4]Total Completions	[10] Receipt Projection	[9]Completion Target
Other							
I-90	Renew/Replace Permanent Resident Cards	751,357	646,158	31,925	678,083	791,166	989,493
I-102	Replace I-94s	7,489	5,438	2,181	7,619	6,308	8,708
I-131	Reentry Permit/Refugee Travel Document	88,236	75,663	3,990	79,653	90,297	108,991
I-1317	Advance Parole	359,715	344,769	26,765	371,534	360,336	371,565
I-131	Parole in Place	10,918	8,595	971	9,566	6,618	11,562
I-360	Immigrant Petitions	39,407	31,329	3,971	35,300	42,758	45,869
I-485	Other Adjustments of Status	33,005	28,281	4,269	32,550	36,304	44,568
I-539	Applications to Extend/ Change Nonimmigr	214,785	207,866	38,516	246,382	212,609	225,600
I-824	Action on Approved Applications or Petiti	10,888	10,835	2,164	12,999	10,367	12,601
I-910	Application for Civil Surgeon	571	432	171	603	632	734
[8]Waivers	Waivers	72,441	36,266	7,676	43,942	77,600	77,788
[2]Immigrant Visas	Immigrant Visas	597,301	617,345	-	617,345	560,000	582,836
[2]EOIR Adjustment	EOIR Adjustment Processing	28,796	27,585	-	27,585	28,796	30,160

Office of Administrative Appeals

The Office of Administrative Appeals issues immigration appeals decisions, including precedent decisions to guide officers and the public, and provides the public with clear and accessible information about the immigration appeals process.

Adjustments to Base Justification

The FY 2018 Budget includes the following adjustments to base:

- Increase of $13.4 million for 1.9 percent pay raise
- Increase of $4.7 million for annualization of the 2017 pay raise
- Increase of $100.2 million, 538 positions and 510 FTEs for changes in operating requirements
- Increase of $22.8 million, 143 positions, and 136 FTEs to implement Executive Orders.

District Operations – PPA
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
District Operations	7,778	7,276	$843,896	$115.98	7,630	7,249	$838,791	$115.71	8,311	7,895	$955,811	$121.07	681	646	$117,020	$5.36
Total	**7,778**	**7,276**	**$843,896**	**$115.98**	**7,630**	**7,249**	**$838,791**	**$115.71**	**8,311**	**7,895**	**$955,811**	**$121.07**	**681**	**646**	**$117,020**	**$5.36**
Mandatory - Fee	7,778	7,276	$843,896	$115.98	7,630	7,249	$838,791	$115.71	8,311	7,895	$955,811	$121.07	681	646	$117,020	$5.36

NARRATIVE EXPLANATION OF CHANGES

FY 2018 request estimates $10.939 million for performance awards. This request remains in line with OPM Awards Guidance on spending limitation.

FTE Change FY 2017-2018: Increase FTE in FY 2018 by 646 due to annualization of FY 2016 reprogramming requirements and FY 2017 workload requirements and requirements to implement Executive Orders.

PCB Change FY 2017-2018: Reflects a 1.9 percent increase for the 2018 pay raise, annualization of the 2017 pay raise, annualization of FY 2016 reprogramming requirements and FY 2017 workload requirements, and requirements to implement Executive Orders.

Average Cost Change FY 2017-2018: An average cost change of $5,354 is based on the pay raise calculations and annualization of the FY 2017 pay and benefits.

District Operations – PPA
Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$603,687	$600,035	$683,746	$83,711
11.3 Other than Full-Time Permanent	$2,574	$2,558	$2,915	$357
11.5 Other Personnel Compensation	$32,077	$31,883	$36,331	$4,448
12.1 Civilian Personnel Benefits	$205,558	$204,315	$232,819	$28,504
Total - Personnel Compensation and Benefits	**$843,896**	**$838,791**	**$955,811**	**$117,020**
Positions and FTE				
Positions - Civilian	7,778	7,630	8,311	681
FTE - Civilian	7,276	7,249	7,895	646

Pay Cost Drivers

Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Salaries and Benefits	7,276	$843,896	$116	7,249	$838,791	$116	7,895	$955,811	$121	646	$117,020	$5
Total – Pay Cost Drivers	**7,276**	**$843,896**	**$116**	**7,249**	**$838,791**	**$116**	**7,895**	**$955,811**	**$121**	**646**	**$117,020**	**$5**

District Operations – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
District Operations	$746,656	$776,618	$800,596	$23,978
Total	**$746,656**	**$776,618**	**$800,596**	**$23,978**
Mandatory - Fee	$746,656	$776,618	$800,596	$23,978

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$8,024	$6,208	$6,402	$194
22.0 Transportation of Things	$2,987	$3,130	$3,228	$98
23.1 Rental Payments to GSA	$130,145	$133,276	$137,432	$4,156
23.2 Rental Payments to Others	$262	$275	$284	$9
23.3 Communications, Utilities, and Misc. Charges	$25,154	$26,357	$27,182	$825
24.0 Printing and Reproduction	$4,262	$4,466	$4,606	$140
25.1 Advisory and Assistance Services	$239,135	$250,576	$258,417	$7,841
25.2 Other Services from Non-Federal Sources	$121,053	$126,845	$130,815	$3,970
25.3 Other Goods and Services from Federal Sources	$110,319	$115,597	$119,215	$3,618
25.4 Operation and Maintenance of Facilities	$35	$37	$38	$1
25.7 Operation and Maintenance of Equipment	$50,821	$53,252	$54,919	$1,667
26.0 Supplies and Materials	$6,522	$6,834	$7,048	$214
31.0 Equipment	$32,051	$33,584	$34,635	$1,051
32.0 Land and Structures	$5,209	$5,458	$5,629	$171
41.0 Grants, Subsidies, and Contributions	$9,987	$10,000	$10,000	-
42.0 Insurance Claims and Indemnities	$690	$723	$746	$23
Total - Non Pay Object Classes	**$746,656**	**$776,618**	**$800,596**	**$23,978**

District Operations – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Information Technology Platform Engineering and Operations	$59,724	$44,534	$44,534	$0
Application Support Center (ASC) Labor and Facilities Contract	$62,697	$63,551	$63,551	$0
FBI Reimbursement for Fingerprint and Name Checks	$44,780	$72,114	$72,114	$0
Rental Payments to GSA	$151,859	$133,276	$137,432	$4,156
Other Costs	$427,596	$463,143	$482,965	$19,822
Total – Non Pay Cost Drivers	**$746,656**	**$776,618**	**$800,596**	**$23,978**

NARRATIVE EXPLANATION OF CHANGES

Information Technology Platform Engineering and Operations: This contract provides USCIS enterprise technology infrastructure engineering services to sustain and strengthen the hardware platforms upon which USCIS software applications reside.

ASC Labor and Facilities: This contract provides facilities for and the operations of USCIS Application Support Centers where applicants and petitioners must appear (when required by USCIS) for biometrics collection. Costs drivers include USCIS application/petition volumes for those benefit types that require biometrics collection. USCIS may also open or close ASCs in certain locations based on the distribution of its customers across the U.S.

FBI Reimbursements: These reimbursements are for FBI to run fingerprint and name checks for USCIS as part of the background check process for anyone seeking to obtain immigration benefits in the United States.

Rental Payments to GSA: The FY 2018 amount is based on projections developed by USCIS's Facilities Division, using information provided by GSA and reflects projected rent increases, termination of leases, and new leases.

Service Center Operations - PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Service Center Operations	3,539	3,352	$599,010	3,846	3,654	$669,891	3,556	3,378	$649,461	(290)	(276)	($20,430)
Total	**3,539**	**3,352**	**$599,010**	**3,846**	**3,654**	**$669,891**	**3,556**	**3,378**	**$649,461**	**(290)**	**(276)**	**($20,430)**
Subtotal Mandatory - Fee	3,539	3,352	$599,010	3,846	3,654	$669,891	3,556	3,378	$649,461	(290)	(276)	($20,430)

Service Center Operations – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$669,891		
Transfers & Reprogrammings	($70,881)		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$599,010**	**$669,891**	**$649,461**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$599,010**	**$669,891**	**$649,461**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$599,010**	**$669,891**	**$649,461**
Obligations (Actual/Projections/Estimates)	$598,473	$669,891	-
Personnel: Positons and FTE			
Enacted/Request Positions	3,539	3,846	3,556
Enacted/Request FTE	3,352	3,654	3,378
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	3,410	3,846	3,556
FTE (Actual/Estimates/Projections)	3,265	3,654	3,378

Service Center Operations – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**3,846**	**3,654**	**$669,891**
USCIS FY16 Reprogramming	(307)	(302)	($70,881)
Total Above Threshold Reprogrammings/Transfers	**(307)**	**(302)**	**($70,881)**
FY 2016 Revised Enacted	**3,539**	**3,352**	**$599,010**
FY 2017 Annualized CR	**3,846**	**3,654**	**$669,891**
FY 2018 Base Budget	**3,846**	**3,654**	**$669,891**
2018 Pay Raise	-	-	$5,062
Annualization of 2017 Pay Raise	-	-	$1,847
Total, Pricing Increases	**-**	**-**	**$6,909**
Workload Adjustment	(290)	(276)	($27,339)
Total, Pricing Decreases	**(290)**	**(276)**	**($27,339)**
Total Adjustments-to-Base	**(290)**	**(276)**	**($20,430)**
FY 2018 Current Services	**3,556**	**3,378**	**$649,461**
FY 2018 Request	**3,556**	**3,378**	**$649,461**
FY 2017 TO FY 2018 Change	**(290)**	**(276)**	**($20,430)**

PPA Description

The FY 2018 Budget includes $649.46 million, 3,556 Positions, and 3,378 Full-Time Equivalents (FTE) for USCIS Service Center Operations to adjudicate applications and ensure improved customer service while delivering the right benefit, to the right person, without undue delay.

This PPA supports the Service Center Operations (SCOPS) directorate and Office of Intake and Document Production (OIDP).

SCOPS is one of the key operational components of USCIS and is responsible for adjudicating the largest volume of applications across the broadest and most diverse cross-section of immigration benefits, which do not require an in-person interview.

OIDP is responsible for the beginning and end of the process for individuals who are seeking immigration benefits. It creates and distributes USCIS forms, secure certificates and informational materials; receives applications and petitions; processes filing fees; generates and distributes USCIS appointment notices; and provides approved individuals with secure documents such as permanent resident (green) cards, employment authorization documents and travel booklets.

Adjustments to Base Justification

The FY 2018 Budget includes the following adjustments to base:

- Increase of $5.1 million for 1.9 percent pay raise
- Increase of $1.8 million for annualization of the 2017 pay raise
- Decrease of $27.3 million, 290 positions and 276 FTEs for changes in operating requirements

Service Center Operations – PPA
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Service Center Operations	3,539	3,352	$411,093	$122.64	3,846	3,654	$438,433	$119.99	3,556	3,378	$362,144	$107.21	(290)	(276)	($76,289)	($12.78)
Total	**3,539**	**3,352**	**$411,093**	**$122.64**	**3,846**	**3,654**	**$438,433**	**$119.99**	**3,556**	**3,378**	**$362,144**	**$107.21**	**(290)**	**(276)**	**($76,289)**	**($12.78)**
Mandatory - Fee	3,539	3,352	$411,093	$122.64	3,846	3,654	$438,433	$119.99	3,556	3,378	$362,144	$107.21	(290)	(276)	($76,289)	($12.78)

NARRATIVE EXPLANATION OF CHANGES

FY 2018 request estimates $4.021 million for performance awards. This request remains in line with OPM Awards Guidance on spending limitation.

FTE Change FY 2017-2018: Decrease FTE in FY 2018 by 276 due to annualization of FY 2016 reprogramming requirements and FY 2017 workload requirements and realignment of positions to the Premium Processing (including Transformation) PPA.

PCB Change FY 2017-2018: Reflects a 1.9 percent increase for the pay raise, annualization of the 2016 pay raise, annualization of FY 2016 reprogramming requirements and FY 2017 workload requirements, and a realignment of positions to the Premium Processing (including Transformation) PPA.

Average Cost Change FY 2017-2018: An average cost change of ($12.78) is based on the pay raise calculations and annualization of the FY 2017 requirements.

Service Center Operations – PPA
Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$285,275	$304,248	$251,307	($52,941)
11.3 Other than Full-Time Permanent	$1,127	$1,202	$993	($209)
11.5 Other Personnel Compensation	$24,020	$25,617	$21,160	($4,457)
12.1 Civilian Personnel Benefits	$100,671	$107,366	$88,684	($18,682)
Total - Personnel Compensation and Benefits	**$411,093**	**$438,433**	**$362,144**	**($76,289)**
Positions and FTE				
Positions - Civilian	3,539	3,846	3,556	(290)
FTE - Civilian	3,352	3,654	3,378	(276)

Pay Cost Drivers

Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Salaries and Benefits	3,352	$411,093	$123	3,654	$438,433	$120	3,378	$362,144	$107	(276)	($76,289)	($13
Total – Pay Cost Drivers	**3,352**	**$411,093**	**$123**	**3,654**	**$438,433**	**$120**	**3,378**	**$362,144**	**$107**	**(276)**	**(76,289**	**($13)**

Service Center Operations – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Service Center Operations	$187,917	$231,458	$287,317	$55,859
Total	**$187,917**	**$231,458**	**$287,317**	**$55,859**
Mandatory - Fee	$187,917	$231,458	$287,317	$55,859

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$2,172	$459	$589	$130
22.0 Transportation of Things	$841	$1,087	$1,394	$307
23.1 Rental Payments to GSA	$34,952	$36,185	$36,910	$725
23.2 Rental Payments to Others	$22	$28	$36	$8
23.3 Communications, Utilities, and Misc. Charges	$22,323	$28,840	$36,983	$8,143
24.0 Printing and Reproduction	$1,502	$1,940	$2,488	$548
25.1 Advisory and Assistance Services	$63,244	$81,707	$104,775	$23,068
25.2 Other Services from Non-Federal Sources	$4,687	$6,055	$7,765	$1,710
25.3 Other Goods and Services from Federal Sources	$33,487	$43,263	$55,478	$12,215
25.4 Operation and Maintenance of Facilities	$44	$57	$73	$16
25.7 Operation and Maintenance of Equipment	$4,283	$5,533	$7,095	$1,562
26.0 Supplies and Materials	$12,668	$16,366	$20,987	$4,621
31.0 Equipment	$7,045	$9,102	$11,672	$2,570
32.0 Land and Structures	$638	$824	$1,057	$233
42.0 Insurance Claims and Indemnities	$9	$12	$15	$3
Total - Non Pay Object Classes	**$187,917**	**$231,458**	**$287,317**	**$55,859**

Service Center Operations – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
USCIS Secure Mail Initiative	$18,061	$17,116	$17,116	$0
Rental Payments to GSA	$30,179	$36,185	$36,910	$725
Treasury Lockbox Reimbursement	$40,509	$49,154	$49,154	$0
Service Center Operations Support Services (SCOSS) Contract	$72,675	$85,809	$85,809	$0
Other Costs	$26,493	$43,194	$98,328	$55,134
Total – Non Pay Cost Drivers	**$187,917**	**$231,458**	**$287,317**	**$55,859**

NARRATIVE EXPLANATION OF CHANGES

USCIS Secure Mail Initiative: Funds priority mail postage for delivery of secure identification documents, which require delivery to be tracked.

Rental Payments to GSA: The FY 2018 amount is based on projections developed by USCIS's Facilities Division, using information provided by GSA and reflects projected rent increases, termination of leases, and new leases.

Treasury Lockbox Reimbursement: USCIS maintains a contract with JP Morgan Chase to support the collection and deposit of revenue for immigration fees. The lockbox performs the initial processing of applications, scanning of materials, and depositing of checks into USCIS accounts.

SCOSS Contract: Provides administrative and technical functions in support of records management at all five Service Centers. Includes file operations, data collection, fee collection and mail operations.

Asylum, Refugee and International Operations - PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Asylum, Refugee and International Operations	1,606	1,447	$284,231	1,381	1,312	$259,042	1,668	1,585	$399,882	287	273	$140,840
Total	**1,606**	**1,447**	**$284,231**	**1,381**	**1,312**	**$259,042**	**1,668**	**1,585**	**$399,882**	**287**	**273**	**$140,840**
Subtotal Mandatory - Fee	1,606	1,447	$284,231	1,381	1,312	$259,042	1,668	1,585	$399,882	287	273	$140,840

Asylum Refugee and International Operations – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$259,042		
Transfers & Reprogrammings	$25,189		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$284,231**	**$259,042**	**$399,882**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$284,231**	**$259,042**	**$399,882**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$284,231**	**$259,042**	**$399,882**
Obligations (Actual/Projections/Estimates)	$276,496	$259,042	-
Personnel: Positons and FTE			
Enacted/Request Positions	1,606	1,381	1,668
Enacted/Request FTE	1,447	1,312	1,585
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	1,381	1,381	1,668
FTE (Actual/Estimates/Projections)	1,212	1,312	1,585

Asylum Refugee and International Operations – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**1,381**	**1,312**	**$259,042**
USCIS FY16 Reprogramming	225	135	$25,189
Total Above Threshold Reprogrammings/Transfers	**225**	**135**	**$25,189**
FY 2016 Revised Enacted	**1,606**	**1,447**	**$284,231**
FY 2017 Annualized CR	**1,381**	**1,312**	**$259,042**
FY 2018 Base Budget	**1,381**	**1,312**	**$259,042**
2018 Pay Raise	-	-	$2,619
Annualization of 2017 Pay Raise	-	-	$898
Workload Adjustment	287	273	$120,446
Workload Adjustment - Executive Orders	-	-	$16,877
Total, Pricing Increases	**287**	**273**	**$140,840**
Total Adjustments-to-Base	**287**	**273**	**$140,840**
FY 2018 Current Services	**1,668**	**1,585**	**$399,882**
FY 2018 Request	**1,668**	**1,585**	**$399,882**
FY 2017 TO FY 2018 Change	**287**	**273**	**$140,840**

PPA Description

The FY 2018 Budget includes $399.9 million, 1,668 Positions, and 1,585 Full-Time Equivalents (FTE) for USCIS's Refugee, Asylum, and International Operations (RAIO) to extend humanitarian protection, citizenship, and other immigration benefits to eligible individuals. In addition, RAIO adjudicates asylum and refugee status applications for individuals seeking protection from persecution and facilitates the process for close relatives of approved refugees and asylees to immigrate to the United States.

Adjustments to Base Justification

The FY 2018 Budget includes the following adjustments to base:

- Increase of $2.6 million for 1.9 percent pay raise
- Increase of $898,000 for annualization of the 2017 pay raise
- Increase of $120.4 million, 287 positions and 273 FTEs for changes in operating requirements
- Increase of $16.9 million to implement Executive Orders related to border security and immigration enforcement.

Asylum Refugee and International Operations – PPA
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Asylum, Refugee and International Operations	1,606	1,447	$183,755	$126.68	1,381	1,312	$161,411	$122.72	1,668	1,585	$187,281	$117.87	287	273	$25,870	($4.85)
Total	**1,606**	**1,447**	**$183,755**	**$126.68**	**1,381**	**1,312**	**$161,411**	**$122.72**	**1,668**	**1,585**	**$187,281**	**$117.87**	**287**	**273**	**$25,870**	**($4.85)**
Mandatory - Fee	1,606	1,447	$183,755	$126.68	1,381	1,312	$161,411	$122.72	1,668	1,585	$187,281	$117.87	287	273	$25,870	($4.85)

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

NARRATIVE EXPLANATION OF CHANGES

FY 2018 request estimates $2.033 million for performance awards. This request remains in line with OPM Awards Guidance on spending limitation.

FTE Change FY 2017-2018: Increase FTE in FY 2018 by 273 due to annualization of FY 2016 reprogramming requirements and FY 2017 workload requirements, and realignment of positions from the Information and Customer Service PPA in FY 2016.

PCB Change FY 2017-2018: Reflects a 1.9 percent increase for the pay raise, annualization of the 2016 pay raise, annualization of FY 2016 reprogramming requirements and FY 2017 workload requirements, and a realignment of positions from the Information and Customer Service PPA in FY 2016.

Average Cost Change FY 2017-2018: An average cost change of ($4.86) is based on the pay raise calculations and annualization of the FY 2017 requirements.

Asylum Refugee and International Operations – PPA
Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$124,677	$109,516	$127,069	$17,553
11.3 Other than Full-Time Permanent	$5,224	$4,589	$5,324	$735
11.5 Other Personnel Compensation	$7,006	$6,154	$7,140	$986
12.1 Civilian Personnel Benefits	$46,395	$40,754	$47,286	$6,532
13.0 Benefits for Former Personnel	$453	$398	$462	$64
Total - Personnel Compensation and Benefits	**$183,755**	**$161,411**	**$187,281**	**$25,870**
Positions and FTE				
Positions - Civilian	1,606	1,381	1,668	287
FTE - Civilian	1,447	1,312	1,585	273

Pay Cost Drivers

Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Salaries and Benefits	1,447	$183,755	$127	1,312	$161,411	$123	1,585	$187,281	$118	273	$25,870	($5)
Total – Pay Cost Drivers	**1,447**	**$183,755**	**$127**	**1,312**	**$161,411**	**$123**	**1,585**	**$187,281**	**$118**	**273**	**$25,870**	**($5)**

Asylum Refugee and International Operations – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Asylum, Refugee and International Operations	$100,476	$97,631	$212,601	$114,970
Total	**$100,476**	**$97,631**	**$212,601**	**$114,970**
Mandatory - Fee	$100,476	$97,631	$212,601	$114,970

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$23,415	$17,129	$42,025	$24,896
22.0 Transportation of Things	$833	$991	$2,596	$1,605
23.1 Rental Payments to GSA	$15,994	$18,662	$18,716	$54
23.2 Rental Payments to Others	$1,990	$2,366	$6,199	$3,833
23.3 Communications, Utilities, and Misc. Charges	$3,240	$3,853	$10,095	$6,242
24.0 Printing and Reproduction	$5	$6	$16	$10
25.1 Advisory and Assistance Services	$8,711	$10,359	$27,139	$16,780
25.2 Other Services from Non-Federal Sources	$21,383	$25,427	$66,618	$41,191
25.3 Other Goods and Services from Federal Sources	$1,747	$2,077	$5,442	$3,365
25.7 Operation and Maintenance of Equipment	$2,714	$3,227	$8,455	$5,228
26.0 Supplies and Materials	$771	$917	$2,403	$1,486
31.0 Equipment	$1,098	$1,306	$3,422	$2,116
32.0 Land and Structures	$422	$502	$1,315	$813
41.0 Grants, Subsidies, and Contributions	$18,150	$10,805	$18,150	$7,345
42.0 Insurance Claims and Indemnities	$3	$4	$10	$6
Total - Non Pay Object Classes	**$100,476**	**$97,631**	**$212,601**	**$114,970**

Asylum Refugee and International Operations – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
DHS Working Capital Fund Contributions	$12,195	$10,490	$10,490	$0
USCIS Cuban and Haitian Entrant Program (CHEP) Grants	$18,150	$10,805	$18,150	$7,345
Dept. of State Reimbursement for Services Performed Overseas on USCIS's Behalf	$23,000	$25,000	$25,000	$0
Travel	$23,415	$17,129	$42,025	$24,896
Other Costs	$23,716	$34,207	$116,936	$82,729
Total – Non Pay Cost Drivers	**$100,476**	**$97,631**	**$212,601**	**$114,970**

NARRATIVE EXPLANATION OF CHANGES

DHS Working Capital Fund Contributions: This item represents contributions to shared services provided centrally through the DHS Working Capital Fund. Decreases from FY 2015 to FY 2016 reflect revised allocations and the removal of certain activities from the Working Capital Fund.

CHEP: Provides funding through cooperative agreements to organizations that serve Cubans and Haitians paroled into the United States.

DOS Reimbursement: This interagency agreement is for services that DOS provides for USCIS at overseas consular locations.

Travel: This includes travel for refugee and asylum applicant interviews and includes travel to the Southwest Border to interview detainees as required through the Executive Order on border security and immigration enforcement.

Records Operations - PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Records Operations	396	360	$129,368	359	341	$124,177	430	408	$135,477	71	67	$11,300
Total	**396**	**360**	**$129,368**	**359**	**341**	**$124,177**	**430**	**408**	**$135,477**	**71**	**67**	**$11,300**
Subtotal Mandatory - Fee	396	360	$129,368	359	341	$124,177	430	408	$135,477	71	67	$11,300

Records Operations – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$124,177		
Transfers & Reprogrammings	$5,191		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$129,368**	**$124,177**	**$135,477**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$129,368**	**$124,177**	**$135,477**
Collections – Reimbursable Resources	$3,599	$3,599	$3,599
Total Budget Resources	**$132,967**	**$127,776**	**$139,076**
Obligations (Actual/Projections/Estimates)	$110,129	$127,776	-
Personnel: Positons and FTE			
Enacted/Request Positions	396	359	430
Enacted/Request FTE	360	341	408
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	348	359	430
FTE (Actual/Estimates/Projections)	327	341	408

Records Operations – PPA
Collections – Reimbursable Resources
Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Homeland Security - US Immigration and Customs Enforcement	Source	-	-	$2,409	-	-	$2,409	-	-	$2,409
Independent Agency - Social Security Administration	Source	-	-	$7	-	-	$7	-	-	$7
Department of Homeland Security - US Customs and Border Protection	Source	-	-	$1,183	-	-	$1,183	-	-	$1,183
Total Collections		-	-	**$3,599**	-	-	**$3,599**	-	-	**$3,599**

Records Operations – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**359**	**341**	**$124,177**
USCIS FY16 Reprogramming	37	19	$5,191
Total Above Threshold Reprogrammings/Transfers	**37**	**19**	**$5,191**
FY 2016 Revised Enacted	**396**	**360**	**$129,368**
FY 2017 Annualized CR	**359**	**341**	**$124,177**
FY 2018 Base Budget	**359**	**341**	**$124,177**
2018 Pay Raise	-	-	$576
Annualization of 2017 Pay Raise	-	-	$200
Workload Adjustment	71	67	$10,524
Total, Pricing Increases	**71**	**67**	**$11,300**
Total Adjustments-to-Base	**71**	**67**	**$11,300**
FY 2018 Current Services	**430**	**408**	**$135,477**
FY 2018 Request	**430**	**408**	**$135,477**
FY 2017 TO FY 2018 Change	**71**	**67**	**$11,300**

PPA Description

The FY 2018 Budget includes $135.5 million, 430 positions, and 408 Full-Time Equivalents (FTE) for USCIS management of U.S. immigration records.

This PPA supports the Records Division and the National Records Center (NRC) within the Immigration Records and Identity Services Directorate (IRIS). The Records Division administers immigration records created by USCIS and enforcement records created by other DHS entities, including alien registration files (A-files). The NRC stores and accesses over 18 million A-files, providing customers with timely and appropriate access to requested records and information in an efficient manner. In addition, NRC is responsible for the largest Freedom of Information Act (FOIA) program within the Federal Government.

Adjustments to Base Justification

The FY 2018 Budget includes the following adjustments to base:

- Increase of $576,000 for 1.9 percent pay raise
- Increase of $200 million for annualization of the 2017 pay raise
- Increase of $10.5 million, 71 positions and 67 FTEs for changes in operating requirements

Records Operations – PPA
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Records Operations	396	360	$36,734	$102.04	359	341	$34,301	$100.59	430	408	$41,222	$101.03	71	67	$6,921	$0.44
Total	**396**	**360**	**$36,734**	**$102.04**	**359**	**341**	**$34,301**	**$100.59**	**430**	**408**	**$41,222**	**$101.03**	**71**	**67**	**$6,921**	**$0.44**
Mandatory - Fee	396	360	$36,734	$102.04	359	341	$34,301	$100.59	430	408	$41,222	$101.03	71	67	$6,921	$0.44

NARRATIVE EXPLANATION OF CHANGES

FY 2018 request estimates $449 thousand for performance awards. This request remains in line with OPM Awards Guidance on spending limitation.

FTE Change FY 2017-2018: Increase FTE in FY 2018 by 67 due to annualization of FY 2016 reprogramming requirements and FY 2017 requirements.

PCB Change FY 2017-2018: Reflects a 1.9 percent increase for the pay raise, annualization of the 2016 pay raise, and annualization of FY 2016 reprogramming requirements and FY 2017 requirements.

Average Cost Change FY 2017-2018: An average cost change of $445 is based on the pay raise calculations and annualization of the FY 2017 requirements.

Records Operations – PPA
Pay by Object Class
Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$25,009	$23,352	$28,064	$4,712
11.3 Other than Full-Time Permanent	$442	$413	$496	$83
11.5 Other Personnel Compensation	$2,589	$2,418	$2,906	$488
12.1 Civilian Personnel Benefits	$8,694	$8,118	$9,756	$1,638
Total - Personnel Compensation and Benefits	**$36,734**	**$34,301**	**$41,222**	**$6,921**
Positions and FTE				
Positions - Civilian	396	359	430	71
FTE - Civilian	360	341	408	67

Pay Cost Drivers
Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Salaries and Benefits	360	$36,734	$102	341	$34,301	$101	408	$41,222	$101	67	$6,921	$0
Total – Pay Cost Drivers	**360**	**$36,734**	**$102**	**341**	**$34,301**	**$101**	**408**	**$41,222**	**$101**	**67**	**$6,921**	**$0**

Records Operations – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Records Operations	$92,634	$89,876	$94,255	$4,379
Total	**$92,634**	**$89,876**	**$94,255**	**$4,379**
Mandatory - Fee	$92,634	$89,876	$94,255	$4,379

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$144	$214	$225	$11
22.0 Transportation of Things	$105	$100	$105	$5
23.1 Rental Payments to GSA	$7,066	$7,902	$8,052	$150
23.3 Communications, Utilities, and Misc. Charges	$4,888	$4,678	$4,919	$241
24.0 Printing and Reproduction	$943	$903	$950	$47
25.1 Advisory and Assistance Services	$71,040	$67,994	$71,502	$3,508
25.2 Other Services from Non-Federal Sources	$949	$908	$955	$47
25.3 Other Goods and Services from Federal Sources	$1,795	$1,718	$1,807	$89
25.4 Operation and Maintenance of Facilities	$367	$351	$369	$18
25.7 Operation and Maintenance of Equipment	$168	$161	$169	$8
26.0 Supplies and Materials	$509	$487	$512	$25
31.0 Equipment	$4,283	$4,099	$4,310	$211
32.0 Land and Structures	$377	$361	$380	$19
Total - Non Pay Object Classes	**$92,634**	**$89,876**	**$94,255**	**$4,379**

Records Operations – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Records Compaction - USCIS Record Audit and Retention	$6,775	$7,854	$7,854	$0
Retired Records Storage - National Archives and Records Admin. (NARA) Reimbursement	$10,355	$12,918	$12,918	$0
National Records Center (NRC) and National Benefits Center (NBC) Records Operations Support	$32,487	$42,854	$42,854	$0
Other Costs	$43,018	$26,250	$30,629	$4,379
Total – Non Pay Cost Drivers	**$92,634**	**$89,876**	**$94,255**	**$4,379**

NARRATIVE EXPLANATION OF CHANGES

Records Compaction: This cost is to compact older A-Files stored at the Federal Records Center to improve data integrity and reduce the number of lost files.

Retired Records Storage: This funds the storage of inactive immigration records as USCIS must move them to other storage facilities to free up space for active A-Files.

NRC Records Center and National Benefits Center Records Operations Support: This funds centralized storage and maintenance of immigration records at the NRC. This supports the NBC with records management, file operations, quality control/business process improvement, and reporting services. Contract levels fluctuate based on application/petition volume receipts.

Premium Processing (Including Transformation) - PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Premium Processing (Including Transformation)	447	419	$436,637	-	-	$226,380	1,430	1,359	$620,829	1,430	1,359	$394,449
Total	**447**	**419**	**$436,637**	**-**	**-**	**$226,380**	**1,430**	**1,359**	**$620,829**	**1,430**	**1,359**	**$394,449**
Subtotal Mandatory - Fee	447	419	$436,637	-	-	$226,380	1,430	1,359	$620,829	1,430	1,359	$394,449

Premium Processing (Including Transformation) – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$226,380		
Transfers & Reprogrammings	$210,257		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$436,637**	**$226,380**	**$620,829**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$436,637**	**$226,380**	**$620,829**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$436,637**	**$226,380**	**$620,829**
Obligations (Actual/Projections/Estimates)	$398,552	$226,380	-
Personnel: Positons and FTE			
Enacted/Request Positions	447	-	1,430
Enacted/Request FTE	419	-	1,359
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	404	-	1,430
FTE (Actual/Estimates/Projections)	416	-	1,359

Premium Processing (Including Transformation) – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$226,380**
USCIS FY16 Reprogramming	447	419	$210,257
Total Above Threshold Reprogrammings/Transfers	**447**	**419**	**$210,257**
FY 2016 Revised Enacted	**447**	**419**	**$436,637**
FY 2017 Annualized CR	**-**	**-**	**$226,380**
FY 2018 Base Budget	**-**	**-**	**$226,380**
2018 Pay Raise	-	-	$1,998
Annualization of 2017 Pay Raise	-	-	$268
Workload Adjustment	1,430	1,359	$388,433
Workload Adjustment - Executive Orders	-	-	$3,750
Total, Pricing Increases	**1,430**	**1,359**	**$394,449**
Total Adjustments-to-Base	**1,430**	**1,359**	**$394,449**
FY 2018 Current Services	**1,430**	**1,359**	**$620,829**
FY 2018 Request	**1,430**	**1,359**	**$620,829**
FY 2017 TO FY 2018 Change	**1,430**	**1,359**	**$394,449**

PPA Description

The FY 2018 Budget includes $620.8 million, 1,430 positions, and 1,359 Full-Time Equivalents (FTE) for USCIS to: 1) adjudicate cases for business customers that have requested premium processing service; 2) fund the operations, maintenance, and acquisition costs for USCIS' business transformation investment, the Electronic Immigration System (ELIS); 3) fund infrastructure improvements in the adjudications and customer service processes; and 4) fund positions to manage application/petition processing backlogs.

In FY 2015, USCIS ELIS transitioned to an agile software development methodology and a less complex technology architecture. In FY 2016, the program focused on deploying the capability to process the Application for Naturalization (Form N-400). USCIS also focused on finalizing activities designed to operationally reduce its legacy ELIS footprint with the de-commission of Legacy

ELIS.

In FY 2017, the Transformation program was re-located to the Office of Information Technology (OIT) and is focusing on completing the following business objectives:

Transformation Business Objectives (FY 2017 and FY 2018)

Business Objectives (FY 2017)
2nd Quarter • Transition to OIT • Immediate fixes to background checks • Improve Testing • Improve architecture • Reduce Technical Debt
3rd Quarter • Pivot N-400 to ELIS • Improve background checks • Fix gaps in I-90 and N-400 • Reduce Technical Debt • Re-baseline Program
4th Quarter • Improve flow of I-90 and N-400 • Add enterprise features • Better integration • Reduce Technical Debt • Add immigrant features
Business Objectives (FY 2018)
1st Quarter • Improve flow of I-90 and N-400 • Improve flow of IV fee • Add enterprise features • Add immigrant features • Implement insider threat features

2nd Quarter • Improve flow of EADs • Add enterprise features • Better integration • Add immigrant features • Implement security features
3rd Quarter • Add enterprise features • Better integration • Add immigrant features • Implement security features
4th Quarter • Add immigrant features • EDIS (Data exchange with reps) • Enterprise data quality improvements

Adjustments to Base Justification

The FY 2018 Budget includes the following adjustments to base:

- Increase of $2.0 million for 1.9 percent pay raise
- Increase of $268.0 thousand for annualization of the 2017 pay raise
- Increase of $388.4 million, 1,430 positions and 1,359 FTEs for changes in operating requirements

Premium Processing (Including Transformation) – PPA
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Premium Processing (Including Transformation)	447	419	$45,484	$108.55	-	-	-	-	1,430	1,359	$142,460	$104.83	1,430	1,359	$142,460	$104.83
Total	**447**	**419**	**$45,484**	**$108.55**	**-**	**-**	**-**	**-**	**1,430**	**1,359**	**$142,460**	**$104.83**	**1,430**	**1,359**	**$142,460**	**$104.83**
Mandatory - Fee	447	419	$45,484	$108.55	-	-	-	-	1,430	1,359	$142,460	$104.83	1,430	1,359	$142,460	$104.83

NARRATIVE EXPLANATION OF CHANGES

FY 2018 request estimates $1.582 million for performance awards. This request remains in line with OPM Awards Guidance on spending limitation.

FTE Change FY 2017-2018: Increase FTE in FY 2018 by 1,359 due to annualization of FY 2016 reprogramming requirements and FY 2017 requirements, and realignment of positions from District Operations (i.e., positions supporting the Transformation Program (ELIS)) and Service Center Operations (i.e., positions adjudicating premium processing workload) PPAs in FY 2016.

PCB Change FY 2017-2018: Reflects a 1.9 percent increase for the pay raise, annualization of the 2016 pay raise, annualization of FY 2016 reprogramming requirements and FY 2017 requirements, and realignment of positions from District Operations and Service Center Operations PPAs in FY 2016.

Average Cost Change FY 2017-2018: An average cost change of $104.83 is based on the pay raise calculations and the addition of FY 2016 and FY 2017 requirements.

Premium Processing (Including Transformation) – PPA
Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$31,563	-	$98,858	$98,858
11.3 Other than Full-Time Permanent	$119	-	$373	$373
11.5 Other Personnel Compensation	$2,973	-	$9,312	$9,312
12.1 Civilian Personnel Benefits	$10,829	-	$33,917	$33,917
Total - Personnel Compensation and Benefits	**$45,484**	**-**	**$142,460**	**$142,460**
Positions and FTE				
Positions - Civilian	447	-	1,430	1,430
FTE - Civilian	419	-	1,359	1,359

Pay Cost Drivers

Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Salaries and Benefits	419	$45,484	$109	0	$0	$0	1,359	$142,460	$105	1,359	$142,460	$105
Total – Pay Cost Drivers	**419**	**$45,484**	**$109**	**0**	**$0**	**$0**	**1,359**	**$142,460**	**$105**	**1,359**	**$142,460**	**$105**

Premium Processing (Including Transformation) – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Premium Processing (Including Transformation)	$391,153	$226,380	$478,369	$251,989
Total	**$391,153**	**$226,380**	**$478,369**	**$251,989**
Mandatory - Fee	$391,153	$226,380	$478,369	$251,989

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$183	$123	$264	$141
22.0 Transportation of Things	$18	$10	$21	$11
23.1 Rental Payments to GSA	$5,711	$5,948	$6,061	$113
23.3 Communications, Utilities, and Misc. Charges	$8,858	$5,065	$10,853	$5,788
25.1 Advisory and Assistance Services	$237,560	$135,849	$291,076	$155,227
25.2 Other Services from Non-Federal Sources	$6,158	$3,521	$7,544	$4,023
25.3 Other Goods and Services from Federal Sources	$16,409	$9,383	$20,104	$10,721
25.7 Operation and Maintenance of Equipment	$52,110	$29,799	$63,849	$34,050
26.0 Supplies and Materials	$386	$221	$474	$253
31.0 Equipment	$49,971	$28,576	$61,228	$32,652
32.0 Land and Structures	$13,778	$7,879	$16,882	$9,003
42.0 Insurance Claims and Indemnities	$11	$6	$13	$7
Total - Non Pay Object Classes	**$391,153**	**$226,380**	**$478,369**	**$251,989**

Premium Processing (Including Transformation) – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Information Technology Platform Engineering and Operations	$11,382	$10,518	$10,518	$0
Independent Verification and Validation	$23,633	$16,238	$16,238	$0
Flexible Agile Development Services (FADS)	$20,969	$43,957	$43,957	$0
Other Costs	$322,612	$137,829	$389,818	$251,989
Total – Non Pay Cost Drivers	**$391,153**	**$226,380**	**$478,369**	**$251,989**

NARRATIVE EXPLANATION OF CHANGES

Information Technology Platform Engineering and Operations: This item consists of contract costs to design and engineer the technical infrastructure of ELIS - both in the cloud as well as in the DHS data centers.

Independent Verification and Validation: This category includes contractual costs for third-party verification and validation of ELIS code to ensure it is acceptable to USCIS before it is deployed in the live production system.

Flexible Agile Development Services Contracts: This item consists of contracts for agile software development of ELIS.

Information and Customer Services - PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Information and Customer Services	317	299	$97,932	360	342	$124,041	329	313	$109,445	(31)	(29)	($14,596)
Total	**317**	**299**	**$97,932**	**360**	**342**	**$124,041**	**329**	**313**	**$109,445**	**(31)**	**(29)**	**($14,596)**
Subtotal Mandatory - Fee	317	299	$97,932	360	342	$124,041	329	313	$109,445	(31)	(29)	($14,596)

Information and Customer Services – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$124,041		
Transfers & Reprogrammings	($26,109)		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$97,932**	**$124,041**	**$109,445**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$97,932**	**$124,041**	**$109,445**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$97,932**	**$124,041**	**$109,445**
Obligations (Actual/Projections/Estimates)	$96,553	$124,041	-
Personnel: Positons and FTE			
Enacted/Request Positions	317	360	329
Enacted/Request FTE	299	342	313
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	329	360	329
FTE (Actual/Estimates/Projections)	304	342	313

Information and Customer Services – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**360**	**342**	**$124,041**
USCIS FY16 Reprogramming	(43)	(43)	($26,109)
Total Above Threshold Reprogrammings/Transfers	**(43)**	**(43)**	**($26,109)**
FY 2016 Revised Enacted	**317**	**299**	**$97,932**
FY 2017 Annualized CR	**360**	**342**	**$124,041**
FY 2018 Base Budget	**360**	**342**	**$124,041**
2018 Pay Raise	-	-	$496
Annualization of 2017 Pay Raise	-	-	$181
Total, Pricing Increases	**-**	**-**	**$677**
Workload Adjustment	(31)	(29)	($15,273)
Total, Pricing Decreases	**(31)**	**(29)**	**($15,273)**
Total Adjustments-to-Base	**(31)**	**(29)**	**($14,596)**
FY 2018 Current Services	**329**	**313**	**$109,445**
FY 2018 Request	**329**	**313**	**$109,445**
FY 2017 TO FY 2018 Change	**(31)**	**(29)**	**($14,596)**

PPA Description

The FY 2018 Budget includes $109.4 million, 329 positions, and 313 Full-Time Equivalents (FTE) for USCIS to support the Customer Service and Public Engagement Directorate (CSPED). CSPED manages more than 14 million engagements with customers annually over multiple channels and various tiers of service, designs and develops enterprise online tools and resources, and leads agency-wide dialogue with external stakeholders.

CSPED manages the National Customer Service Center (NCSC) 1-800 number for USCIS, and conducts customer-centric engagements so USCIS customers and stakeholders can receive accurate, timely, consistent information and effective resolution of their specific issues during their first contact with the agency.

CSPED also manages online customer service tools such as Case Status Online and e-Request as well as serves as an agency leader in transformation and innovation to build a unified digital customer experience.

Call Volume			
Call Centers	FY 16 Actual	FY 17 Projected	FY 18 Projected
Tier 1	6,698,508	7,741,620	8,470,044
Tier 2	1,026, 681	1,076,667	1,196,296

Adjustments to Base Justification

The FY 2018 Budget includes the following adjustments to base:

- Increase of $496,000 for 1.9 percent pay raise
- Increase of $181,000 for annualization of the 2017 pay raise
- Decrease of $15.3 million, 31 positions and 29 FTEs for changes in operating requirements

Information and Customer Services – PPA
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Information and Customer Services	317	299	$32,177	$107.62	360	342	$35,731	$104.48	329	313	$35,484	$113.37	(31)	(29)	($247)	$8.89
Total	**317**	**299**	**$32,177**	**$107.62**	**360**	**342**	**$35,731**	**$104.48**	**329**	**313**	**$35,484**	**$113.37**	**(31)**	**(29)**	**($247)**	**$8.89**
Mandatory - Fee	317	299	$32,177	$107.62	360	342	$35,731	$104.48	329	313	$35,484	$113.37	(31)	(29)	($247)	$8.89

NARRATIVE EXPLANATION OF CHANGES

FY 2018 request estimates $413 thousand for performance awards. This request remains in line with OPM Awards Guidance on spending limitation.

FTE Change FY 2017-2018: Decrease in FY 2018 FTE by 29 due to annualization of FY 2016 reprogramming requirements and FY 2017 requirements, and realignment of positions to the Asylum, Refugee and International Operations PPA in FY 2016.

PCB Change FY 2017-2018: Reflects a 1.9 percent increase for the pay raise, annualization of the 2016 pay raise, annualization of FY 2016 reprogramming requirements and FY 2017 requirements, and realignment of positions to Asylum, Refugee and International Operations PPA in FY 2016.

Average Cost Change FY 2017-2018: An average cost change of $8.89 is based on the pay raise calculations and annualization of the FY 2017 requirements.

Information and Customer Services-PPA
Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$23,410	$25,996	$25,816	($180)
11.3 Other than Full-Time Permanent	$155	$172	$171	($1)
11.5 Other Personnel Compensation	$778	$864	$858	($6)
12.1 Civilian Personnel Benefits	$7,834	$8,699	$8,639	($60)
Total - Personnel Compensation and Benefits	**$32,177**	**$35,731**	**$35,484**	**($247)**
Positions and FTE				
Positions - Civilian	317	360	329	(31)
FTE - Civilian	299	342	313	(29)

Pay Cost Drivers

Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Salaries and Benefits	299	$32,177	$108	342	$35,731	$104	313	$35,484	$113	(29)	$247	($9)
Total – Pay Cost Drivers	**299**	**$32,177**	**$108**	**342**	**$35,731**	**$104**	**313**	**$35,484**	**$113**	**(29)**	**$247**	**($9)**

Information and Customer Services – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Information and Customer Services	$65,755	$88,310	$73,961	($14,349)
Total	**$65,755**	**$88,310**	**$73,961**	**($14,349)**
Mandatory - Fee	$65,755	$88,310	$73,961	($14,349)

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$319	$289	$240	($49)
22.0 Transportation of Things	$36	$49	$41	($8)
23.1 Rental Payments to GSA	$3,422	$3,589	$3,657	$68
23.3 Communications, Utilities, and Misc. Charges	$3,566	$4,855	$4,029	($826)
24.0 Printing and Reproduction	$1,132	$1,541	$1,279	($262)
25.1 Advisory and Assistance Services	$50,288	$68,469	$56,816	($11,653)
25.2 Other Services from Non-Federal Sources	$662	$901	$748	($153)
25.3 Other Goods and Services from Federal Sources	$2,007	$2,733	$2,268	($465)
25.4 Operation and Maintenance of Facilities	$53	$72	$60	($12)
25.7 Operation and Maintenance of Equipment	$305	$415	$344	($71)
26.0 Supplies and Materials	$1,691	$2,302	$1,910	($392)
31.0 Equipment	$1,860	$2,532	$2,101	($431)
32.0 Land and Structures	$399	$543	$451	($92)
42.0 Insurance Claims and Indemnities	$15	$20	$17	($3)
Total - Non Pay Object Classes	**$65,755**	**$88,310**	**$73,961**	**($14,349)**

Information and Customer Services - PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
End User Desktop and Mobile Services	$0	$3,466	$3,466	$0
DHS Working Capital Fund Contributions	$5,533	$4,759	$4,759	$0
USCIS Call Center Contracts	$43,989	$43,989	$43,989	$0
Other Costs	$16,233	$36,097	$21,748	($14,349)
Total – Non Pay Cost Drivers	**$65,755**	**$88,310**	**$73,961**	**($14,349)**

NARRATIVE EXPLANATION OF CHANGES

End User Desktop and Mobile Services: This item includes end-user IT support to USCIS employees and contractors, as well as maintenance and support of locally-housed IT equipment and wireless devices. This amount only represents a portion of the total annual contract cost attributable to Information and Customer Service.

DHS Working Capital Fund Contributions: This item represents contributions to shared services provided centrally through the DHS Working Capital Fund

Call Center Contracts: This item funds two nationwide call center contracts to operate the bilingual (English/Spanish) USCIS National Customer Service Center (1-800 line). This cost object is impacted by fluctuations in applicant and petitioner volume. USCIS is moving toward a more modern, multi-channel customer contact center which will eventually reduce this cost item. Increased application/petition volumes will be absorbed by more customers moving to online customer service channels.

Administration - PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Administration	1,522	1,423	$434,316	1,472	1,398	$384,585	1,645	1,563	$522,010	173	165	$137,425
Total	**1,522**	**1,423**	**$434,316**	**1,472**	**1,398**	**$384,585**	**1,645**	**1,563**	**$522,010**	**173**	**165**	**$137,425**
Subtotal Mandatory - Fee	1,522	1,423	$434,316	1,472	1,398	$384,585	1,645	1,563	$522,010	173	165	$137,425

Administration – PPA
Budget Authority and Obligations
Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$384,585		
Transfers & Reprogrammings	$49,731		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$434,316**	**$384,585**	**$522,010**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$434,316**	**$384,585**	**$522,010**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$434,316**	**$384,585**	**$522,010**
Obligations (Actual/Projections/Estimates)	$398,764	$384,585	-
Personnel: Positons and FTE			
Enacted/Request Positions	1,522	1,472	1,645
Enacted/Request FTE	1,423	1,398	1,563
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	1,415	1,472	1,645
FTE (Actual/Estimates/Projections)	1,342	1,398	1,563

Administration – PPA
Summary of Budget Changes
Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**1,472**	**1,398**	**$384,585**
USCIS FY16 Reprogramming	50	25	$49,731
Total Above Threshold Reprogrammings/Transfers	**50**	**25**	**$49,731**
FY 2016 Revised Enacted	**1,522**	**1,423**	**$434,316**
FY 2017 Annualized CR	**1,472**	**1,398**	**$384,585**
FY 2018 Base Budget	**1,472**	**1,398**	**$384,585**
2018 Pay Raise	-	-	$3,382
Annualization of 2017 Pay Raise	-	-	$1,161
Workload Adjustment	173	165	$132,882
Total, Pricing Increases	**173**	**165**	**$137,425**
Total Adjustments-to-Base	**173**	**165**	**$137,425**
FY 2018 Current Services	**1,645**	**1,563**	**$522,010**
FY 2018 Request	**1,645**	**1,563**	**$522,010**
FY 2017 TO FY 2018 Change	**173**	**165**	**$137,425**

PPA Description

The FY 2018 Budget includes $522 million, 1,645 positions, and 1,563 Full-Time Equivalents (FTE) in this PPA to support a wide variety of USCIS headquarters offices including the Office of the Director, Administration, the Investment Management Division, the Chief Financial Officer, Chief Counsel, Privacy, Contracting, Policy and Strategy, Equal Opportunity and Inclusion, Chief Human Capital Officer, and Security and Integrity. In addition, it also supports USCIS's newly established External Affairs directorate, which includes the offices of Citizenship, Communications, and Legislative Affairs.

This PPA supports the following functions: procurement operations; management of property plant and equipment, and other material resources; budget, planning and performance measures, strategic sourcing, financial and capital asset management; human resources and personnel recruitment, hiring, training, leadership development, employee benefits, and work-life programs; immigration forms, print services, and the management of security and emergency management operations.

The table below depicts actual and projected workloads for select functions included in the Administration PPA.

Responsible Office	Workload Measure	FY 2016 Actual	FY 2017 Projected	FY 2018 Projected
Office of Human Capital and Training	Personnel Actions	13,483	15,225	18,403
Office of Human Capital and Training	Employees Completing BASIC Immigration Adjudicator Training	978	1,015	960
Office of Security and Integrity	Adjudicative Determinations[1]	9,114	11,357	13,353
Office of Security and Integrity	Entry on Duty (EOD) Determinations[2]	12,300	14,760	15,941
Office of Equal Opportunity and Inclusion	Formal Complaint Filings	87	88	88
Office of Equal Opportunity and Inclusion	Disability Accommodation Requests	1,043	1,050	1,055
Office of Equal Opportunity and Inclusion	Informal Complaint Filings	132	152	150

[1]Includes suitability, fitness, security, reinvestigation, and Secure Compartmented Information (SCI) eligibility case types not including contract-to-contract transfers or internal employee selections.
[2]Includes new hires, transfers from other Federal agencies, internal employee selections, contract-to-contract transfers, and multiple contract support.

Adjustments to Base Justification

The FY 2018 Budget includes the following adjustments to base:

- Increase of $3.4 million for 1.9 percent pay raise
- Increase of $1.2 million for annualization of the 2017 pay raise
- Increase of $132.9 million, 173 positions and 165 FTEs for changes in operating requirements

Administration – PPA
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Administration	1,522	1,423	$206,691	$144.96	1,472	1,398	$201,441	$143.81	1,645	1,563	$241,869	$154.44	173	165	$40,428	$10.63
Total	**1,522**	**1,423**	**$206,691**	**$144.96**	**1,472**	**1,398**	**$201,441**	**$143.81**	**1,645**	**1,563**	**$241,869**	**$154.44**	**173**	**165**	**$40,428**	**$10.63**
Mandatory - Fee	1,522	1,423	$206,691	$144.96	1,472	1,398	$201,441	$143.81	1,645	1,563	$241,869	$154.44	173	165	$40,428	$10.63

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

NARRATIVE EXPLANATION OF CHANGES

FY 2018 request estimates $2.782 million for performance awards. This request remains in line with OPM Awards Guidance on spending limitation.

FTE Change FY 2017-2018: Increase in FY 2018 FTEs by 165 due to annualization of FY 2016 reprogramming requirements and FY 2017 requirements.

PCB Change FY 2017-2018: Reflects a 1.9 percent increase for the pay raise, annualization of the 2016 pay raise, and annualization of FY 2016 reprogramming requirements and FY 2017 requirements.

Average Cost Change FY 2017-2018: An average cost change of $10.63 is based on the pay raise calculations and annualization of the FY 2017 requirements.

Administration – PPA
Pay by Object Class
Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$148,550	$144,777	$173,833	$29,056
11.3 Other than Full-Time Permanent	$2,387	$2,326	$2,793	$467
11.5 Other Personnel Compensation	$2,434	$2,372	$2,848	$476
12.1 Civilian Personnel Benefits	$52,909	$51,565	$61,914	$10,349
13.0 Benefits for Former Personnel	$411	$401	$481	$80
Total - Personnel Compensation and Benefits	**$206,691**	**$201,441**	**$241,869**	**$40,428**
Positions and FTE				
Positions - Civilian	1,522	1,472	1,645	173
FTE - Civilian	1,423	1,398	1,563	165

Pay Cost Drivers
Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Salaries and Benefits	1,423	$206,691	$145	1,398	$201,441	$144	1,563	$241,869	$155	165	$40,428	$11
Total – Pay Cost Drivers	**1,423**	**$206,691**	**$145**	**1,398**	**$201,441**	**$144**	**1,563**	**$241,869**	**$155**	**165**	**$40,428**	**$11**

Administration – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Administration	$227,625	$183,144	$280,141	$96,997
Total	**$227,625**	**$183,144**	**$280,141**	**$96,997**
Mandatory - Fee	$227,625	$183,144	$280,141	$96,997

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$4,106	$5,040	$8,141	$3,101
22.0 Transportation of Things	$7,522	$5,747	$9,283	$3,536
23.1 Rental Payments to GSA	$24,527	$26,058	$26,413	$355
23.2 Rental Payments to Others	$643	$491	$793	$302
23.3 Communications, Utilities, and Misc. Charges	$14,041	$10,728	$17,328	$6,600
24.0 Printing and Reproduction	$1,216	$929	$1,501	$572
25.1 Advisory and Assistance Services	$33,977	$25,961	$41,934	$15,973
25.2 Other Services from Non-Federal Sources	$29,165	$22,284	$35,993	$13,709
25.3 Other Goods and Services from Federal Sources	$84,767	$64,771	$104,619	$39,848
25.4 Operation and Maintenance of Facilities	$193	$147	$237	$90
25.7 Operation and Maintenance of Equipment	$4,207	$3,214	$5,191	$1,977
26.0 Supplies and Materials	$2,611	$1,995	$3,222	$1,227
31.0 Equipment	$12,260	$9,368	$15,131	$5,763
32.0 Land and Structures	$7,246	$5,537	$8,943	$3,406
42.0 Insurance Claims and Indemnities	$1,144	$874	$1,412	$538
Total - Non Pay Object Classes	**$227,625**	**$183,144**	**$280,141**	**$96,997**

Administration – PPA

Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Office of Security and Integrity Contract Support	$18,466	$14,840	$14,840	$0
OPM Background Investigation Reimbursement	$14,916	$22,220	$22,220	$0
USCIS Field Overheads (e.g., Utilities, Local Guard Services, etc.)	$54,201	$59,171	$59,171	$0
USCIS Lease Acquisition Plan	$12,851	$64,895	$64,895	$0
Other Costs	$127,191	$22,018	$119,015	$96,997
Total – Non Pay Cost Drivers	**$227,625**	**$183,144**	**$280,141**	**$96,997**

NARRATIVE EXPLANATION OF CHANGES

Office of Security and Integrity Contract Support: This item supports physical (facility) security upgrades, including program management and equipment purchases, and purchase of replacement security equipment such as secure benefit approval and denial seals/stamps.

OPM Background Investigation Reimbursement: This item consists of reimbursements to the Office of Personnel Management for employee background investigations. Costs are impacted by the number of onboard employees and the cyclic nature of 5-year reinvestigations due to past hiring surges, as well as OPM reimbursement rates.

USCIS Field Overheads: This item includes expenses at USCIS field facilities to fund local guard services, utilities, housekeeping/cleaning, and other mandatory costs. This cost item is impacted by where USCIS field offices are located. Many costs are included in the GSA rent charges for federally owned buildings as opposed to leased locations. Costs will change as USCIS opens or closes offices across the U.S.

USCIS Lease Acquisition Plan: This item represents buildout costs for new facilities and renovation/upgrade projects for existing facilities.

Systematic Alien Verification for Entitlements (SAVE) –PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Systematic Alien Verification for Entitlements (SAVE)	223	212	$32,320	223	212	$27,021	223	212	$34,828	-	-	$7,807
Total	**223**	**212**	**$32,320**	**223**	**212**	**$27,021**	**223**	**212**	**$34,828**	**-**	**-**	**$7,807**
Subtotal Mandatory - Fee	223	212	$32,320	223	212	$27,021	223	212	$34,828	-	-	$7,807

Systematic Alien Verification for Entitlements (SAVE) – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$27,021		
Transfers & Reprogrammings	$5,299		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$32,320**	**$27,021**	**$34,828**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$32,320**	**$27,021**	**$34,828**
Collections – Reimbursable Resources	$7,000	$7,000	$7,000
Total Budget Resources	**$39,320**	**$34,021**	**$41,828**
Obligations (Actual/Projections/Estimates)	$31,891	$34,021	-
Personnel: Positons and FTE			
Enacted/Request Positions	223	223	223
Enacted/Request FTE	212	212	212
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	199	223	223
FTE (Actual/Estimates/Projections)	198	212	212

Systematic Alien Verification for Entitlements (SAVE) – PPA
Collections – Reimbursable Resources

Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
SAVE Collections	Source	-	-	$7,000	-	-	$7,000	-	-	$7,000
Total Collections		**-**	**-**	**$7,000**	**-**	**-**	**$7,000**	**-**	**-**	**$7,000**

Systematic Alien Verification for Entitlements (SAVE) – PPA
Summary of Budget Changes
Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**223**	**212**	**$27,021**
USCIS FY16 Reprogramming	-	-	$5,299
Total Above Threshold Reprogrammings/Transfers	**-**	**-**	**$5,299**
FY 2016 Revised Enacted	**223**	**212**	**$32,320**
FY 2017 Annualized CR	**223**	**212**	**$27,021**
FY 2018 Base Budget	**223**	**212**	**$27,021**
2018 Pay Raise	-	-	$306
Annualization of 2017 Pay Raise	-	-	$113
Workload Adjustment	-	-	$7,388
Total, Pricing Increases	**-**	**-**	**$7,807**
Total Adjustments-to-Base	**-**	**-**	**$7,807**
FY 2018 Current Services	**223**	**212**	**$34,828**
FY 2018 Request	**223**	**212**	**$34,828**
FY 2017 TO FY 2018 Change	**-**	**-**	**$7,807**

PPA Description

The FY 2018 Budget includes $34.8 million, 223 positions, and 212 Full-Time Equivalents (FTE) in this PPA to support the SAVE program.

SAVE is an intergovernmental information-sharing program that assists Federal, State and local agencies in determining an individual's eligibility for licenses or public benefits. SAVE helps agencies ensure that only persons eligible for licenses or benefits receive them by providing relevant information on immigration or naturalized/derived citizenship status from Federal databases. SAVE is also used to verify the status of applicants for health insurance under the Patient Protection and Affordable Care Act (PPACA). As of September 30, 2016, 1,140 agencies were enrolled in SAVE, and they ran more than 20 million unique queries. Customers include Federal agencies, State departments of motor vehicles, licensing bureaus, etc. Every state and the District of Columbia are represented in SAVE's customer base. The SAVE program is funded by a combination of user charges paid by its agency customers and general fee receipts paid by USCIS immigration benefit applicants and petitioners.

The following table depicts the actual SAVE workload for FY 2016, along with projections for FY 2017 and FY 2018. Staffing is mainly driven by SAVE second and third step queries, i.e., those that cannot be processed solely through the automated process and require human intervention by a Status Verification Officer (SVO) to research the case and provide a response to the customer agency. The SAVE program is building a more sophisticated analysis feature in its system modernization efforts to increase automation and decrease the reliance on manual verification. This new feature will be implemented in fourth quarter of 2017.

Systematic Alien Verification for Entitlements (SAVE)

Actual and projected Workload for FY 2016 - FY 2018

	FY 2016 Actual	FY 2017 Projected	FY 2018 Projected
SAVE Automated Queries	20,308,847	20,214,031	20,515,981
SAVE Status Verification Officer 2nd Step Queries	1,645,479	1,473,603	1,495,615
SAVE Status Verification Officer 3rd Step Queries	278,238	220,333	223,624
SAVE Customer Agencies as of Sept. 30	1,140	1,184	1,192

Adjustments to Base Justification

The FY 2018 Budget includes the following adjustments to base:

- Increase of $306,000 for 1.9 percent pay raise
- Increase of $113,000 for annualization of the 2017 pay raise
- Increase of $7.4 million for changes in operating requirements

Systematic Alien Verification for Entitlements (SAVE) – PPA
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Systematic Alien Verification for Entitlements (SAVE)	223	212	$21,784	$102.75	223	212	$21,784	$102.75	223	212	$21,861	$103.12	-	-	$77	$0.37
Total	**223**	**212**	**$21,784**	**$102.75**	**223**	**212**	**$21,784**	**$102.75**	**223**	**212**	**$21,861**	**$103.12**	**-**	**-**	**$77**	**$0.37**
Mandatory - Fee	223	212	$21,784	$102.75	223	212	$21,784	$102.75	223	212	$21,861	$103.12	-	-	$77	$0.37

NARRATIVE EXPLANATION OF CHANGES

FY 2018 request estimates $247 thousand for performance awards. This request remains in line with OPM Awards Guidance on spending limitation.

FTE Change FY 2017-2018: No change in FTE.

PCB Change FY 2017-2018: Reflects a 1.9 percent increase for the pay raise and annualization of the 2016 pay raise.

Average Cost Change FY 2017-2018: An average cost change of $363 is based on the pay raise calculations and annualization of the FY 2017 requirements.

Systematic Alien Verification for Entitlements (SAVE) – PPA
Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$15,436	$15,436	$15,490	$54
11.3 Other than Full-Time Permanent	$2	$2	$2	-
11.5 Other Personnel Compensation	$1,064	$1,064	$1,068	$4
12.1 Civilian Personnel Benefits	$5,282	$5,282	$5,301	$19
Total - Personnel Compensation and Benefits	**$21,784**	**$21,784**	**$21,861**	**$77**
Positions and FTE				
Positions - Civilian	223	223	223	-
FTE - Civilian	212	212	212	-

Pay Cost Drivers

Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Cost Driver	212	$21,784	$103	212	$21,784	$103	212	$21,861	$103	0	$77	$0
Total – Pay Cost Drivers	**212**	**$21,784**	**$103**	**212**	**$21,784**	**$103**	**212**	**$21,861**	**$103**	**0**	**$77**	**$0**

Systematic Alien Verification for Entitlements (SAVE) – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Systematic Alien Verification for Entitlements (SAVE)	$10,536	$5,237	$12,967	$7,730
Total	**$10,536**	**$5,237**	**$12,967**	**$7,730**
Mandatory - Fee	$10,536	$5,237	$12,967	$7,730

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$24	$18	$77	$59
22.0 Transportation of Things	$1	-	-	-
23.1 Rental Payments to GSA	$2,810	$2,898	$2,954	$56
23.2 Rental Payments to Others	$14	$4	$17	$13
23.3 Communications, Utilities, and Misc. Charges	$144	$43	$184	$141
24.0 Printing and Reproduction	$5	$2	$9	$7
25.1 Advisory and Assistance Services	$6,760	$2,038	$8,724	$6,686
25.2 Other Services from Non-Federal Sources	$263	$79	$338	$259
25.3 Other Goods and Services from Federal Sources	$422	$127	$544	$417
25.7 Operation and Maintenance of Equipment	$13	$4	$17	$13
26.0 Supplies and Materials	$33	$10	$43	$33
31.0 Equipment	$47	$14	$60	$46
Total - Non Pay Object Classes	**$10,536**	**$5,237**	**$12,967**	**$7,730**

Systematic Alien Verification for Entitlements (SAVE) – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
DHS Working Capital Fund Contributions	$660	$337	$387	$0
Verification Information System (VIS) O&M	$6,581	$1,276	$1,276	$0
Rental payments to GSA	$2,810	$2,898	$2,954	$56
Other Costs	$485	$726	$8,350	$7,674
Total – Non Pay Cost Drivers	**$10,536**	**$5,237**	**$12,967**	**$7,730**

NARRATIVE EXPLANATION OF CHANGES

DHS Working Capital Fund Contributions: This item represents contributions to shared services provided centrally through the DHS Working Capital Fund.

VIS O&M: This contract provides operations and maintenance support for the Verification Information System (VIS), the back-end platform upon which SAVE resides. This represents the share attributable to SAVE. The share attributable to E-Verify, which also resides upon the VIS back-end is reflected in the discretionary Operations and Support appropriation.

Rental Payments to GSA: The FY 2018 amount is based on projections developed by USCIS's Facilities Division, using information provided by GSA and reflects projected rent increases, termination of leases, and new leases.

Department of Homeland Security

United States Citizenship and Immigration Services

H-1B Nonimmigrant Petitioner Account

Fiscal Year 2018
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H-1B Nonimmigrant Petitioner Account

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Service Center Operations	$15,000	$15,000	$15,000	-
Total	**$15,000**	**$15,000**	**$15,000**	**-**
Mandatory - Fee	$15,000	$15,000	$15,000	-

Overview

U.S. Citizenship and Immigration Services' (USCIS) H-1B Nonimmigrant Petitioner Account, established by Section 286 (s) of the Immigration and Nationality Act (8 U.S.C. 1356 (s)), supports activities related to petitions for nonimmigrant workers in the H-1B visa classification. The H-1B Visa program allows U.S. employers to temporarily employ foreign workers in specialty occupations. Resources deposited in the H-1B Nonimmigrant Petitioner Account support USCIS's operations that adjudicate employment-based petitions for H-1B nonimmigrants.

For Fiscal Year (FY) 2018, the H-1B Nonimmigrant Petitioner Account includes funding in a single Program, Project, or Activity (PPA), Service Center Operations. Resources in this PPA are dedicated to a portion of the facility rent cost for the Service Center Operations Directorate and a share of the contractual cost for correspondence management, data collection and file operations support at three of the five USCIS service centers.

H-1B Nonimmigrant Petitioner Account
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$15,000		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	$15,000	$15,000	$15,000
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$15,000**	**$15,000**	**$15,000**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$15,000**	**$15,000**	**$15,000**
Obligations (Actual/Projections/Estimates)	$15,000	$15,000	-
Personnel: Onboard and FTE			
Onboard (Actual/Estimates/Projections)	0	0	0
FTE (Actual/Estimates/Projections)	0	0	0

H-1B Nonimmigrant Petitioner Account
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	-	-	$15,000
FY 2016 Revised Enacted	-	-	$15,000
FY 2017 Annualized CR	-	-	**$15,000**
FY 2018 Base Budget	-	-	**$15,000**
FY 2018 Current Services	-	-	**$15,000**
FY 2018 Request	-	-	**$15,000**
FY 2017 TO FY 2018 Change	-	-	-

H-1B Nonimmigrant Petitioner Account
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Service Center Operations	$15,000	$15,000	$15,000	-
Total	**$15,000**	**$15,000**	**$15,000**	**-**
Mandatory - Fee	$15,000	$15,000	$15,000	-

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
23.1 Rental Payments to GSA	$2,000	$2,000	$2,000	-
25.1 Advisory and Assistance Services	$13,000	$13,000	$13,000	-
Total - Non Pay Object Classes	**$15,000**	**$15,000**	**$15,000**	**-**

Service Center Operations - PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Service Center Operations	-	-	$15,000	-	-	$15,000	-	-	$15,000	-	-	-
Total	-	-	**$15,000**	-	-	**$15,000**	-	-	**$15,000**	-	-	-
Subtotal Mandatory - Fee	-	-	$15,000	-	-	$15,000	-	-	$15,000	-	-	-

Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$15,000		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	$15,000	$15,000	$15,000
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$15,000**	**$15,000**	**$15,000**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$15,000**	**$15,000**	**$15,000**
Obligations (Actual/Projections/Estimates)	$15,000	$15,000	-
Personnel: Onboard and FTE			
Onboard (Actual/Estimates/Projections)	0	0	0
FTE (Actual/Estimates/Projections)	0	0	0

Service Center Operations – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	-	-	$15,000
FY 2016 Revised Enacted	-	-	$15,000
FY 2017 Annualized CR	-	-	**$15,000**
FY 2018 Base Budget	-	-	**$15,000**
FY 2018 Current Services	-	-	**$15,000**
FY 2018 Request	-	-	**$15,000**
FY 2017 TO FY 2018 Change	-	-	-

PPA Description

This PPA supports the adjudication processes of nonimmigrant worker petitions for the H-1B visa classification. The revenue from H-1B fees primarily funds $13.0 million in contract support (mail, filing, and data entry), and $2.0 million in space rent expenses necessary to process and adjudicate immigration benefit applications and petitions at two of the five USCIS processing service centers.

USCIS annually processes millions of immigration benefit applications and petitions. The $15.0 million estimated for FY 2018 for contract activities and facility rent finances a portion of the total contract and rent expenses. The balance is covered by funding from the Immigration Examinations Fee Account.

USCIS requires $15.0 million, 0 Positions, and 0 Full-Time Equivalents (FTE) to maintain current services in this PPA.

Adjustments to Base Justification

There is no change from the FY 2017 base funding level.

Service Center Operations – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Service Center Operations	$15,000	$15,000	$15,000	-
Total	**$15,000**	**$15,000**	**$15,000**	**-**
Mandatory - Fee	$15,000	$15,000	$15,000	-

Service Center Operations – PPA
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
23.1 Rental Payments to GSA	$2,000	$2,000	$2,000	-
25.1 Advisory and Assistance Services	$13,000	$13,000	$13,000	-
Total - Non Pay Object Classes	**$15,000**	**$15,000**	**$15,000**	**-**

Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Service Center Operations Support Services Contract	$13,000	$13,000	$13,000	$0
Rental Payments to GSA	$2,000	$2,000	$2,000	$0
Total – Non Pay Cost Drivers	**$15,000**	**$15,000**	**$15,000**	**$0**

NARRATIVE EXPLANATION OF CHANGES

- **Service Center Operations Contracts:** $13.0 million of H-1B revenue funds contractual support and is based on historical allocations.

- **Rental Payments to GSA:** $2.0 million of H-1B revenue funds facility rent costs for adjudication staff located in two of the five processing service centers that USCIS operates. The cost is based on the historical allocations.

Department of Homeland Security

United States Citizenship and Immigration Services

Fraud Prevention and Detection Account

Fiscal Year 2018
Congressional Justification

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Fraud Prevention and Detection Account

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
District Operations	115	115	$27,390	115	115	$29,523	115	115	$45,101	-	-	$15,578
Service Center Operations	70	70	$20,603	70	70	$15,169	70	70	$21,778	-	-	$6,609
Asylum and Refugee Operating Expenses	-	-	$308	-	-	$308	-	-	$308	-	-	-
Total	**185**	**185**	**$48,301**	**185**	**185**	**$45,000**	**185**	**185**	**$67,187**	-	-	**$22,187**
Subtotal Mandatory - Fee	185	185	$48,301	185	185	$45,000	185	185	$67,187	-	-	$22,187

Overview

The Fraud Prevention and Detection Account (FPDA), established by Section 286 (v) of the *Immigration and Nationality Act* (8 U.S.C. 1356 (v)), supports activities related to preventing and detecting fraud in the delivery of all immigration benefit types and funds necessary operations, mission support, and associated management and administration (M&A) costs.

Resources made available through the FPDA support USCIS's mission to enhance the integrity of the legal immigration system by leading efforts to identify threats to national security and public safety, detect and combat immigration benefit fraud, and remove systematic and other vulnerabilities. Resources from the FPDA are not sufficient to fund all of USCIS's fraud detection and national security programs; funds from the Immigration Examinations Fee Account (IEFA) also support these programs.

The FPDA provides funds for the Fraud Detection and National Security Directorate (FDNS) within USCIS as well as the Service Center Operations Directorate (SCOD). FDNS leads agency efforts to determine whether individuals or organizations filing for immigration benefits pose a threat to national security, public safety, or the integrity of the nation's immigration system.

The FPDA funds 115 FDNS positions and 70 SCOD positions. Salary and benefits funded through the FPDA represent a portion of the overall staff resources required to determine whether individuals or organizations filing for immigration benefits pose a threat to national security, public safety, or the integrity of the nation's immigration system. The remaining salary and benefit costs supporting this activity are funded through the IEFA account.

The following table provides a summary of USCIS's total processing of referred fraud detection cases:

Fraud Detection Referrals Processed[1]

FY 2016 (Actual)	Projected FY 2017	Projected FY 2018
119,434	119,987	133,303

Source: Fraud Detection and National Security Data System.

Of the 119,434 referrals FDNS received in Fiscal Year (FY) 2016:

- 5,870 were national security concerns
- 2,527 were public safety leads and 13,907 were public safety cases
- 22,624 were fraud leads and 21,620 were fraud cases
- 40,156 were requests for assistance
- 1,398 were requests for overseas verification
- 11,332 were requests for benefit fraud assessments

For FY 2018, the FPDA includes the following Programs, Projects, and Activities (PPAs):

- **District Operations:** This includes the cost of agency efforts to determine whether individuals or organizations filing for immigration benefits pose a threat to national security, public safety, or the integrity of the nation's immigration system.
- **Service Center Operations:** This includes costs to support immigration officers and specialized teams of adjudication staff located in USCIS service centers that work with law enforcement agencies and other government agencies to conduct extensive research and vetting of individuals and employer organizations to protect the national security of the United States.
- **Asylum, Refugee and International Operations:** Includes costs to support program operations administered by FDNS employees stationed overseas, including site visit travel costs related to fraud verification activities carried out by FDNS officers.

[1] For the purpose of this document, the term "referral" indicates any request for FDNS to review, investigate, or support USCIS workload. This differs from the standard definition of FDNS-DS "referral" that does not include requests to FDNS to conduct administrative investigations of fraud.

Fraud Prevention and Detection Account
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$45,000		
Transfers & Reprogrammings	$3,301		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$48,301**	**$45,000**	**$67,187**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$48,301**	**$45,000**	**$67,187**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$48,301**	**$45,000**	**$67,187**
Obligations (Actual/Projections/Estimates)	$45,143	$45,000	-
Personnel: Positons and FTE			
Enacted/Request Positions	185	185	185
Enacted/Request FTE	185	185	185
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	162	185	185
FTE (Actual/Estimates/Projections)	191	185	185

Fraud Prevention and Detection Account
Summary of Budget Changes
Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**185**	**185**	**$45,000**
USCIS FY16 Reprogramming	-	-	$3,301
Total Above Threshold Reprogrammings/Transfers	**-**	**-**	**$3,301**
FY 2016 Revised Enacted	**185**	**185**	**$48,301**
FY 2017 Annualized CR	**185**	**185**	**$45,000**
FY 2018 Base Budget	**185**	**185**	**$45,000**
2018 Pay Raise	-	-	$336
Annualization of 2017 Pay Raise	-	-	$124
Change in Operating Requirements	-	-	$21,727
Total, Pricing Increases	**-**	**-**	**$22,187**
Total Adjustments-to-Base	**-**	**-**	**$22,187**
FY 2018 Current Services	**185**	**185**	**$67,187**
FY 2018 Request	**185**	**185**	**$67,187**
FY 2017 TO FY 2018 Change	**-**	**-**	**$22,187**

Fraud Prevention and Detection Account
Justification of Pricing Changes

Dollars in Thousands

Pricing Changes	FY 2018 President's Budget		
	Positions	FTE	Amount
Pricing Change 1 - 2018 Pay Raise	-	-	**$336**
District Operations	-	-	$228
Service Center Operations	-	-	$108
Pricing Change 2 - Annualization of 2017 Pay Raise	-	-	**$124**
District Operations	-	-	$84
Service Center Operations	-	-	$40
Pricing Change 3 - Change in Operating Requirements	-	-	**$21,727**
District Operations	-	-	$15,266
Service Center Operations	-	-	$6,461
Total Pricing Changes	-	-	**$22,187**

- ***2018 Pay Raise:*** Increase of $336,000 to factor in 1.9 percent pay raise in 2018.
- ***Annualization of 2017 Pay Raise:*** Increase of $124,000 for annualization of the 2017 pay raise. FTEs are a fully burdened cost that includes annualizations from prior year.
- ***Change in Operating Requirements:*** Increase of $21.7 million for additional spending authority for the District Operations PPA by $15.3 million and Service Center Operations by $6.5 million. Additional funding in FPDA will assist with prevention and detection of fraud for immigration benefit types, including expanded efforts related to enhanced vetting or security checks.

Fraud Prevention and Detection Account
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
District Operations	115	115	$15,370	$133.65	115	115	$15,370	$133.65	115	115	$16,294	$141.69	-	-	$924	$8.04
Service Center Operations	70	70	$7,547	$107.81	70	70	$7,547	$107.81	70	70	$7,733	$110.47	-	-	$186	$2.66
Total	**185**	**185**	**$22,917**	**$123.88**	**185**	**185**	**$22,917**	**$123.88**	**185**	**185**	**$24,027**	**$129.88**	**-**	**-**	**$1,110**	**$6**
Mandatory - Fee	185	185	$22,917	$123.88	185	185	$22,917	$123.88	185	185	$24,027	$129.88	-	-	$1,110	$6

Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$16,303	$16,303	$17,086	$783
11.3 Other than Full-Time Permanent	$55	$55	$58	$3
11.5 Other Personnel Compensation	$965	$965	$1,019	$54
12.1 Civilian Personnel Benefits	$5,594	$5,594	$5,864	$270
Total - Personnel Compensation and Benefits	**$22,917**	**$22,917**	**$24,027**	**$1,110**
Positions and FTE				
Positions - Civilian	185	185	185	-
FTE - Civilian	185	185	185	-

Fraud Prevention and Detection Account
Permanent Positions by Grade – Appropriation

Grades and Salary Range	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
GS-15	6	6	6	-
GS-14	22	22	22	-
GS-13	82	82	82	-
GS-12	62	62	62	-
GS-11	5	5	5	-
GS-9	7	7	7	-
GS-7	1	1	1	-
Total Permanent Positions	**185**	**185**	**185**	**-**
Unfilled Positions EOY	23	-	-	-
Total Perm. Employment (Filled Positions) EOY	162	185	185	-
Position Locations				
Headquarters	9	9	9	-
U.S. Field	174	174	174	-
Foreign Field	2	2	2	-
Averages				
Average Personnel Costs, GS Positions	98,147	100,208	101,811	1,603
Average Grade, GS Positions	13	13	13	-

Fraud Prevention and Detection Account
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
District Operations	$12,020	$14,153	$28,807	$14,654
Service Center Operations	$13,056	$7,622	$14,045	$6,423
Asylum and Refugee Operating Expenses	$308	$308	$308	-
Total	**$25,384**	**$22,083**	**$43,160**	**$21,077**
Mandatory - Fee	$25,384	$22,083	$43,160	$21,077

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$427	$314	$671	$357
22.0 Transportation of Things	$36	$44	$94	$50
23.1 Rental Payments to GSA	$1,736	$1,785	$1,817	$32
23.2 Rental Payments to Others	$38	$46	$98	$52
23.3 Communications, Utilities, and Misc. Charges	$7	$8	$17	$9
24.0 Printing and Reproduction	$2	$2	$4	$2
25.1 Advisory and Assistance Services	$18,013	$15,582	$31,997	$16,415
25.2 Other Services from Non-Federal Sources	$3,467	$2,850	$5,474	$2,624
25.3 Other Goods and Services from Federal Sources	$616	$696	$1,477	$781
26.0 Supplies and Materials	$879	$567	$1,109	$542
31.0 Equipment	$163	$189	$402	$213
Total - Non Pay Object Classes	**$25,384**	**$22,083**	**$43,160**	**$21,077**

District Operations – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
District Operations	115	115	$27,390	115	115	$29,523	115	115	$45,101	-	-	$15,578
Total	**115**	**115**	**$27,390**	**115**	**115**	**$29,523**	**115**	**115**	**$45,101**	**-**	**-**	**$15,578**
Subtotal Mandatory - Fee	115	115	$27,390	115	115	$29,523	115	115	$45,101	-	-	$15,578

Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**115**	**115**	**$29,523**
USCIS FY16 Reprogramming	-	-	($2,133)
Total Above Threshold Reprogrammings/Transfers	**-**	**-**	**($2,133)**
FY 2016 Revised Enacted	**115**	**115**	**$27,390**
FY 2017 Annualized CR	**115**	**115**	**$29,523**
FY 2018 Base Budget	**115**	**115**	**$29,523**
2018 Pay Raise	-	-	$228
Annualization of 2017 Pay Raise	-	-	$84
Change in Operating Requirements	-	-	$15,266
Total, Pricing Increases	**-**	**-**	**$15,578**
Total Adjustments-to-Base	**-**	**-**	**$15,578**
FY 2018 Current Services	**115**	**115**	**$45,101**
FY 2018 Request	**115**	**115**	**$45,101**
FY 2017 TO FY 2018 Change	**-**	**-**	**$15,578**

PPA Level II Description

The FY 2018 Budget proposes $45.1 million, 115 Positions, and 115 FTE in this PPA.

FDNS Officers are posted in every USCIS regional, district, or field office within the United States. As part of their duties, FDNS Officers participate in U.S. Immigration and Customs Enforcement's Document Benefit Fraud Task Forces, the Federal Bureau of Investigation's Joint Terrorism Task Forces, State and Local Fusion Centers and other Federal and local law enforcement initiatives, through which they share immigration related information, assist law enforcement investigations, and provide subject matter expertise.

In order to ensure compliance in select visa petition categories, FDNS district-based officers conduct unannounced pre- and post-adjudication site inspections under the Administrative Site Visit and Verification Program (ASVVP). In FY 2014, FDNS expanded the ASVVP to include petitions for L-1A Intra-company Transferee Executive or Manager, in addition to organizations filing Form I-129 (Petition for a Nonimmigrant Worker) petitions for H-1B temporary workers and Form I-360 (Petition for Amerasian, Widow(er) or Special Immigrant) petitions for religious workers. Pursuant to regulation, site inspections are conducted prior to the adjudication of religious worker petitions. Compliance reviews are also conducted on a random sample of approved petitions for religious workers and H-1B temporary workers as well as L-1As. During these site visits, FDNS officers seek to determine whether the petitioner and beneficiary have met, or continue to meet, eligibility requirements for the immigration benefit sought. FDNS officers verify information submitted with the petition, confirm the existence of the petitioning entity, review public records, take photographs, and speak with organizational representatives and the beneficiary.

Adjustments to Base Justification

The FY 2018 Budget includes the following adjustments to base:

- Increase of $228,000 for 1.9 percent pay raise
- Increase of $84,000 to annualize the 2017 pay raise
- Increase of $15.3 million for changes in operating requirements

District Operations – PPA
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
District Operations	115	115	$15,370	$133.65	115	115	$15,370	$133.65	115	115	$16,294	$141.69	-	-	$924	$8.04
Total	**115**	**115**	**$15,370**	**$133.65**	**115**	**115**	**$15,370**	**$133.65**	**115**	**115**	**$16,294**	**$141.69**	**-**	**-**	**$924**	**$8.04**
Mandatory - Fee	115	115	$15,370	$133.65	115	115	$15,370	$133.65	115	115	$16,294	$141.69	-	-	$924	$8.04

NARRATIVE EXPLANATION OF CHANGES

FTE Change FY 2017-2018: No change in FTE

PCB Change FY 2017-2018: Reflects a 1.9 percent increase for the 2018 pay raise and annualization of the 2017 pay raise

Average Cost Change FY 2017-2018: An average cost change of $8 thousand is based on the pay raise calculations and annualization of the FY 2017 spending authority requirements

District Operations – PPA
Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$10,747	$10,747	$11,393	$646
11.3 Other than Full-Time Permanent	$55	$55	$58	$3
11.5 Other Personnel Compensation	$846	$846	$897	$51
12.1 Civilian Personnel Benefits	$3,722	$3,722	$3,946	$224
Total - Personnel Compensation and Benefits	**$15,370**	**$15,370**	**$16,294**	**$924**
Positions and FTE				
Positions - Civilian	115	115	115	-
FTE - Civilian	115	115	115	-

Pay Cost Drivers

Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Salaries and Benefits	115	$15,370	$134	115	$15,370	$134	115	$16,294	$142	0	$924	$8.035
Total – Pay Cost Drivers	**115**	**$15,370**	**$134**	**115**	**$15,370**	**$134**	**115**	**$16,294**	**$142**	**0**	**$924**	**$8.035**

District Operations – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
District Operations	$12,020	$14,153	$28,807	$14,654
Total	**$12,020**	**$14,153**	**$28,807**	**$14,654**
Mandatory - Fee	$12,020	$14,153	$28,807	$14,654

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$427	$314	$671	$357
22.0 Transportation of Things	$36	$44	$94	$50
23.1 Rental Payments to GSA	$1,226	$1,270	$1,292	$22
23.2 Rental Payments to Others	$38	$46	$98	$52
23.3 Communications, Utilities, and Misc. Charges	$7	$8	$17	$9
24.0 Printing and Reproduction	$2	$2	$4	$2
25.1 Advisory and Assistance Services	$8,325	$10,094	$21,557	$11,463
25.2 Other Services from Non-Federal Sources	$1,165	$1,412	$3,016	$1,604
25.3 Other Goods and Services from Federal Sources	$538	$652	$1,393	$741
26.0 Supplies and Materials	$107	$130	$278	$148
31.0 Equipment	$149	$181	$387	$206
Total - Non Pay Object Classes	**$12,020**	**$14,153**	**$28,807**	**$14,654**

District Operations - PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Fraud Detection and National Security Program Support Contract	$3,953	$5,014	$5,014	$0
Fraud Detection and National Security Data System (FDNS-DS)	$3,267	$3,358	$3,358	$0
Rental Payments to GSA	$863	$1,270	$1,292	$22
Other Costs	$3,937	$4,511	$19,143	$14,632
Total – Non Pay Cost Drivers	**$12,020**	**$14,153**	**$28,807**	**$14,654**

NARRATIVE EXPLANATION OF CHANGES

- **Contract/Program Support:** This funds a portion of contractual cost to deploy advanced fraud detection devices and techniques and intelligence-driven planning. Any contract increase will be attributed to the IEFA account.
- **Contract/Data System:** This funds a portion of the resources necessary to support a portfolio of fraud detection reporting, tracking and fraud detection business-intelligence systems. There is no change in the funding level from FY 2017 to FY 2018. Any contract increase will be attributed to the IEFA account.
- **Rental Payments to GSA:** Provides a portion of the funding for rent payments to GSA. The change from FY 2017 to FY 2018 is due to standard rent increase and lease adjustments.

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Service Center Operations – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Service Center Operations	70	70	$20,603	70	70	$15,169	70	70	$21,778	-	-	$6,609
Total	**70**	**70**	**$20,603**	**70**	**70**	**$15,169**	**70**	**70**	**$21,778**	**-**	**-**	**$6,609**
Subtotal Mandatory - Fee	70	70	$20,603	70	70	$15,169	70	70	$21,778	-	-	$6,609

Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**70**	**70**	**$15,169**
USCIS FY16 Reprogramming	-	-	$5,434
Total Above Threshold Reprogrammings/Transfers	**-**	**-**	**$5,434**
FY 2016 Revised Enacted	**70**	**70**	**$20,603**
FY 2017 Annualized CR	**70**	**70**	**$15,169**
FY 2018 Base Budget	**70**	**70**	**$15,169**
2018 Pay Raise	-	-	$108
Annualization of 2017 Pay Raise	-	-	$40
Change in Operating Requirements	-	-	$6,461
Total, Pricing Increases	**-**	**-**	**$6,609**
Total Adjustments-to-Base	**-**	**-**	**$6,609**
FY 2018 Current Services	**70**	**70**	**$21,778**
FY 2018 Request	**70**	**70**	**$21,778**
FY 2017 TO FY 2018 Change	**-**	**-**	**$6,609**

PPA Level II Description

The FY 2018 Budget proposes $21.778 million, 70 Positions, and 70 FTE in this PPA.

This activity supports immigration officers and specialized teams of adjudication staff located in USCIS service centers that work with law enforcement agencies and other government agencies to conduct extensive research and vetting of individuals and organizations to protect the national security of the United States.

In addition to investigating cases referred for suspected fraud, FDNS officers conduct a range of specialized activities, including: managing the ASVVP workload; receiving and reviewing consular returns marked for confirmed or suspected fraud; and collecting, analyzing, and reporting information on immigration benefit fraud trends in support of local, USCIS, DHS, and national intelligence priorities. Service Center adjudicators and FDNS officers also vet companies through the Validation Instrument for Business Enterprises (VIBE), a web-based tool that uses commercially available information to validate the business operations of companies and organizations looking to employ foreign workers. VIBE enhances USCIS's ability to adjudicate employment-based immigrant and nonimmigrant petitions efficiently and accurately.

Adjustments to Base Justification

The FY 2018 Budget includes the following adjustments to base:

- Increase of $108,000 for 1.9 percent pay raise.
- Increase of $40,000 for annualization of the 2017 pay raise
- Increase of $6.5 million for changes in operating requirements

Service Center Operations – PPA
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Service Center Operations	70	70	$7,547	$107.81	70	70	$7,547	$107.81	70	70	$7,733	$110.47	-	-	$186	$2.66
Total	**70**	**70**	**$7,547**	**$107.81**	**70**	**70**	**$7,547**	**$107.81**	**70**	**70**	**$7,733**	**$110.47**	**-**	**-**	**$186**	**$2.66**
Mandatory - Fee	70	70	$7,547	$107.81	70	70	$7,547	$107.81	70	70	$7,733	$110.47	-	-	$186	$2.66

NARRATIVE EXPLANATION OF CHANGES

The FY 2018 Budget proposes estimates $91,100 for performance awards. This estimate remains in line with OPM Awards Guidance on spending limitation

FTE Change FY 2017-2018: No change in FTE

PCB Change FY 2017-2018: Reflects a 1.9 percent increase for the 2018 pay raise and annualization of the 2017 pay raise

Average Cost Change FY 2017-2018: An average cost change of $2,700 is based on the pay raise calculations and annualization of FY 2017 spending authority requirements

Service Center Operations – PPA
Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$5,556	$5,556	$5,693	$137
11.5 Other Personnel Compensation	$119	$119	$122	$3
12.1 Civilian Personnel Benefits	$1,872	$1,872	$1,918	$46
Total - Personnel Compensation and Benefits	**$7,547**	**$7,547**	**$7,733**	**$186**
Positions and FTE				
Positions - Civilian	70	70	70	-
FTE - Civilian	70	70	70	-

Pay Cost Drivers

Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Salaries and Benefits	70	$7,547	$108	70	$7,547	$108	70	$7,733	$110	0	$186	$2.657
Total – Pay Cost Drivers	**70**	**$7,547**	**$108**	**70**	**$7,547**	**$108**	**70**	**$7,733**	**$110**	**0**	**$186**	**$2.657**

Service Center Operations – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Service Center Operations	$13,056	$7,622	$14,045	$6,423
Total	**$13,056**	**$7,622**	**$14,045**	**$6,423**
Mandatory - Fee	$13,056	$7,622	$14,045	$6,423

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
23.1 Rental Payments to GSA	$510	$515	$525	$10
25.1 Advisory and Assistance Services	$9,688	$5,488	$10,440	$4,952
25.2 Other Services from Non-Federal Sources	$1,994	$1,130	$2,150	$1,020
25.3 Other Goods and Services from Federal Sources	$78	$44	$84	$40
26.0 Supplies and Materials	$772	$437	$831	$394
31.0 Equipment	$14	$8	$15	$7
Total - Non Pay Object Classes	**$13,056**	**$7,622**	**$14,045**	**$6,423**

Service Center Operations – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Validation Instrument for Business Enterprises (VIBE)	$11,276	$6,770	$10,770	$4,000
Rental Payments to GSA	$1,161	$515	$525	$10
Other Costs	$619	$337	$2,750	$2,413
Total – Non Pay Cost Drivers	**$13,056**	**$7,622**	**$14,045**	**$6,423**

NARRATIVE EXPLANATION OF CHANGES

- **Validation Instrument for Business Enterprises (VIBE):** Covers operating costs and the IT support contract for the VIBE system. USCIS uses this system to validate business operations and financial viability of organizations seeking to employ foreign workers, and to identify possible benefit fraud based on the FDNS findings and other government agencies' referrals.
- **Rental Payments to GSA:** Provides a portion of the funding for rent payments to GSA. The change from FY 2017 to FY 2018 is due to standard rent increase and lease adjustments.

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Asylum, Refugee and International Operations – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Asylum and Refugee Operating Expenses	-	-	$308	-	-	$308	-	-	$308	-	-	-
Total	**-**	**-**	**$308**	**-**	**-**	**$308**	**-**	**-**	**$308**	**-**	**-**	**-**
Subtotal Mandatory - Fee	-	-	$308	-	-	$308	-	-	$308	-	-	-

Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$308**
FY 2016 Revised Enacted	**-**	**-**	**$308**
FY 2017 Annualized CR	**-**	**-**	**$308**
FY 2018 Base Budget	**-**	**-**	**$308**
FY 2018 Current Services	**-**	**-**	**$308**
FY 2018 Request	**-**	**-**	**$308**
FY 2017 TO FY 2018 Change	**-**	**-**	**-**

PPA Level II Description

USCIS requires $308,000 to maintain Current Services in this PPA.

FDNS officers are located at each of the USCIS asylum offices located in the United States, the headquarters elements of the Refugee Asylum & International Operations (RAIO) Directorate as well as three overseas locations. FPDA funding supports program operations administered by FDNS employees stationed overseas, including site visit travel costs related to fraud verification activities carried out by FDNS officers.

Asylum, Refugee and International Operations – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Asylum and Refugee Operating Expenses	$308	$308	$308	-
Total	**$308**	**$308**	**$308**	-
Mandatory - Fee	$308	$308	$308	-

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
25.2 Other Services from Non-Federal Sources	$308	$308	$308	-
Total - Non Pay Object Classes	**$308**	**$308**	**$308**	**-**

Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Fraud Detection and National Security Operating Costs	$308	$308	$308	$0
Total – Non Pay Cost Drivers	**$308**	**$308**	**$308**	**$0**

Department of Homeland Security

Federal Law Enforcement Training Center

Budget Overview

Fiscal Year 2018

Congressional Justification

Table of Contents

Federal Law Enforcement Training Center

Appropriation Organization Structure

Organization Name	Level	Fund Type (* Includes Defense Funding)
Federal Law Enforcement Training Center	**Component**	
Operations and Support	**Appropriation**	
Mission Support	PPA	Discretionary - Appropriation
Law Enforcement Training	PPA	Discretionary - Appropriation
Procurement, Construction, and Improvements	**Appropriation**	
Construction and Facility Improvements	PPA	Discretionary - Appropriation

Federal Law Enforcement Training Center
Strategic Context

Component Overview

The Federal Law Enforcement Training Centers (FLETC) are 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, and international law enforcement agencies. The program provides training in areas common to all law enforcement officers, such as firearms, driving, tactics, investigations, and legal training. Under a collaborative training model, federal partner organizations also deliver training unique to their missions as part of this program. The program enables law enforcement stakeholders both within and outside of DHS the ability to obtain quality and cost effective training.

Mission Support: The Mission Support program provides enterprise leadership, management, and business administrative services that sustain the day-to-day management and back office operations. 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.

Construction and Facility Improvements: The Construction and Facility Improvements program supports the improvement of existing owned or leased facilities and real property, and the construction of new facilities.

Component Contributions to Achieving Departmental Missions

The table below shows the alignment of the 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%	51%	14%	1%	<1%	25%
Mission Support						100%

**Totals account for rounding*

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 Name	FY 2016 Revised Enacted		FY 2017 Annualized CR		FY 2018 President's Budget	
	$	FTE	$	FTE	$	FTE
Law Enforcement Training	18,551	77	18,559	69	21,071	68
Total	18,551	77	18,559	69	21,071	68

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 Name	FY 2016 Revised Enacted		FY 2017 Annualized CR		FY 2018 President's Budget	
	$	FTE	$	FTE	$	FTE
Law Enforcement Training	113,824	402	111,859	381	125,910	392
Total	113,824	402	111,859	381	125,910	392

Performance Measures

For *Secure and Manage Our Borders*, Management Measures are displayed, as appropriate, 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 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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	81%	82%	93%	94%	95%	95%
Result:	92%	100%	84%	91%	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 Name	FY 2016 Revised Enacted		FY 2017 Annualized CR		FY 2018 President's Budget	
	$	FTE	$	FTE	$	FTE
Law Enforcement Training	29,353	119	29,267	118	33,174	151
Total	29,353	119	29,267	118	33,174	151

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 Name	FY 2016 Revised Enacted		FY 2017 Annualized CR		FY 2018 President's Budget	
	$	FTE	$	FTE	$	FTE
Law Enforcement Training	1,256	5	1,222	8	1,369	8
Total	1,256	5	1,222	8	1,369	8

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 Name	FY 2016 Revised Enacted		FY 2017 Annualized CR		FY 2018 President's Budget	
	$	FTE	$	FTE	$	FTE
Law Enforcement Training	1,106	4	1,068	8	1,192	8
Total	1,106	4	1,068	8	1,192	8

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 Name	FY 2016 Revised Enacted		FY 2017 Annualized CR		FY 2018 President's Budget	
	$	FTE	$	FTE	$	FTE
Law Enforcement Training	52,314	282	53,985	267	62,009	268
Mission Support	28,075	217	28,034	217	28,034	217
Construction and Facility Improvements	-	-	-	-	-	-
Total	80,389	499	82,019	484	90,043	485

Performance Measures

For *Mature and Strengthen Homeland Security*, two types of performance measures are presented. Strategic Measures represent FLETC 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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	99	107	113	118	123	128
Result:	97	107	114	119	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 thei						
Description: This performance measure reflects the satisfaction of Partner Organizations that 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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	97%	97%	94%	95%	95%	95%
Result:	100%	91%	98%	95%	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 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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	41	25	25	25	15	15
Result:	33	27	17	32	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 POs with the overall 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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	97%	95%	95%	95%	95%	95%
Result:	100%	95%	97%	95%	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 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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	97%	97%	94%	95%	95%	95%
Result:	100%	93%	97%	94%	N/A	N/A

Federal Law Enforcement Training Center
Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Operations and Support	1,133	1,106	$244,480	1,095	1,068	$243,994	1,139	1,112	$272,759	44	44	$28,765
Total	**1,133**	**1,106**	**$244,480**	**1,095**	**1,068**	**$243,994**	**1,139**	**1,112**	**$272,759**	**44**	**44**	**$28,765**
Subtotal Discretionary - Appropriation	1,133	1,106	$244,480	1,095	1,068	$243,994	1,139	1,112	$272,759	44	44	$28,765

Overview

The Federal Law Enforcement Training Centers (FLETC) provide career-long training to law enforcement professionals to help them fulfill their responsibilities safely and proficiently. Over the past 46 years, FLETC has grown into the Nation's largest provider of law enforcement training. Under a collaborative training model, FLETC's Federal partner organizations deliver training unique to their missions, while FLETC provides training in areas common to all law enforcement officers, such as firearms, driving, tactics, investigations, and legal training. Partner agencies realize quantitative and qualitative benefits from this model, including the efficiencies inherent in shared services, higher quality training, and improved interoperability. FLETC's mission is to train all those who protect the homeland, and therefore, its training audience also includes State, local, and tribal departments throughout the United States. Additionally, FLETC's impact extends outside our Nation's borders through international training and capacity-building activities. To ensure the training it offers is up-to-date and relevant to emerging needs, FLETC's curriculum development and review process engages experts from across all levels of law enforcement, and FLETC partners extensively with other agencies and stakeholders in training research and the exchange of best practices to ensure it offers the most effective training subject matter, technologies, and methodologies.

Federal Law Enforcement Training Center
Comparison of Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$245,038		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	($558)		
Revised Enacted/Request	**$244,480**	**$243,994**	**$272,759**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$31,876	$33,985	$5,000
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$276,356**	**$277,979**	**$277,759**
Collections – Reimbursable Resources	$148,760	$274,620	$302,468
Total Budget Resources	**$425,116**	**$552,599**	**$575,227**
Obligations (Actual/Projections/Estimates)	$257,075	$269,181	$273,000
Personnel: Positons and FTE			
Enacted/Request Positions	1,133	1,095	1,139
Enacted/Request FTE	1,106	1,068	1,112
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	1,057	1,348	1,392
FTE (Actual/Estimates/Projections)	964	1,321	1,365

The budget authority and obligations table presents FLETC's total budget authority and anticipated execution. As such, reimbursable authority of $302.468 million and 253 FTE are requested in FY 2018.

Federal Law Enforcement Training Center
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Operations and Support	1,133	1,106	$129,779	$117.19	1,095	1,068	$128,234	$119.91	1,139	1,112	$135,269	$121.49	44	44	$7,035	$1.58
Total	**1,133**	**1,106**	**$129,779**	**$117.19**	**1,095**	**1,068**	**$128,234**	**$119.91**	**1,139**	**1,112**	**$135,269**	**$121.49**	**44**	**44**	**$7,035**	**$1.58**
Discretionary - Appropriation	1,133	1,106	$129,779	$117.19	1,095	1,068	$128,234	$119.91	1,139	1,112	$135,269	$121.49	44	44	$7,035	$1.58

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

Salaries and benefits consume the majority of FLETC's operational funding. However, FLETC is able to keep pay cost drivers to a minimum level through execution of the consolidated training model. Inherent in its charter, the instructional staffing for the FLETC is a shared responsibility between the FLETC and the Partner Organizations – a practice that is mutually beneficial to the FLETC and its Partner Organizations. In a normal workload year, the makeup of the FLETC instructional staff is 50 percent FLETC permanent and 50 percent rotational staff provided by the Partner Organizations on a pro-rata basis.

The overall increase of $7.0 million in pay is due to the addition of 44 FTE to deliver necessary training associated with the President's Executive Orders on *Border Security and Immigration Enforcement Improvements* and *Enhancing Public Safety in the Interior of the United States*, as well as the annualization of the 2017 pay raise and the 2018 pay raise.

Federal Law Enforcement Training Center
Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$88,525	$87,486	$92,232	$4,746
11.3 Other than Full-Time Permanent	$1,476	$1,455	$1,547	$92
11.5 Other Personnel Compensation	$4,778	$4,721	$4,982	$261
11.8 Special Personal Services Payments	$15	$15	$15	-
12.1 Civilian Personnel Benefits	$34,831	$34,403	$36,336	$1,933
13.0 Benefits for Former Personnel	$154	$154	$157	$3
Total - Personnel Compensation and Benefits	**$129,779**	**$128,234**	**$135,269**	**$7,035**
Positions and FTE				
Positions - Civilian	1,133	1,095	1,139	44
FTE - Civilian	1,106	1,068	1,112	44

Federal Law Enforcement Training Center
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Operations and Support	$114,701	$115,760	$137,490	$21,730
Total	**$114,701**	**$115,760**	**$137,490**	**$21,730**
Discretionary - Appropriation	$114,701	$115,760	$137,490	$21,730

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$3,243	$3,288	$3,818	$530
22.0 Transportation of Things	$628	$640	$680	$40
23.2 Rental Payments to Others	$6	$6	$6	-
23.3 Communications, Utilities, and Misc. Charges	$7,126	$7,280	$7,908	$628
24.0 Printing and Reproduction	$699	$699	$1,030	$331
25.1 Advisory and Assistance Services	$1,589	$1,597	$1,829	$232
25.2 Other Services from Non-Federal Sources	$13,770	$13,874	$17,860	$3,986
25.3 Other Goods and Services from Federal Sources	$4,959	$5,073	$5,223	$150
25.4 Operation and Maintenance of Facilities	$31,170	$31,477	$40,236	$8,759
25.6 Medical Care	$3,163	$3,190	$4,196	$1,006
25.7 Operation and Maintenance of Equipment	$6,122	$6,274	$6,451	$177
25.8 Subsistence & Support of Persons	$565	$545	$766	$221
26.0 Supplies and Materials	$13,142	$13,168	$18,811	$5,643
31.0 Equipment	$6,857	$7,023	$7,134	$111
32.0 Land and Structures	$21,654	$21,618	$21,535	($83)
42.0 Insurance Claims and Indemnities	$7	$7	$6	($1)
43.0 Interest and Dividends	$1	$1	$1	-
Total - Non Pay Object Classes	**$114,701**	**$115,760**	**$137,490**	**$21,730**

Federal Law Enforcement Training Center
Supplemental Budget Justification Exhibits

Working Capital Fund

Dollars in Thousands

Appropriation and PPA	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget
Operations and Support	**$3,127**	**$2,122**	**$1,783**
Mission Support	-	$763	$481
Law Enforcement Training	$3,127	$1,359	$1,302
Total Working Capital Fund	**$3,127**	**$2,122**	**$1,783**

FLETC benefits from participating in the DHS Working Capital Fund for Department-wide services. Working Capital Fund transfers, as well as pricing changes, resulted in a decrease of $339,000 in FY 2018.

Federal Law Enforcement Training Center
Authorized/Unauthorized Appropriations

Dollars in Thousands

Budget Activity	Last year of Authorization	Authorized Level	Appropriation in Last Year of Authorization	FY 2018 President's Budget
	Fiscal Year	Amount	Amount	Amount
Operations and Support	N/A	N/A	N/A	272,759
Mission Support	N/A	N/A	N/A	28,034
Law Enforcement Training	N/A	N/A	N/A	244,725
Total Direct Authorization/Appropriation	N/A	N/A	N/A	272,759

Federal Law Enforcement Training Center
Proposed Legislative Language

For necessary expenses of the Federal Law Enforcement Training Centers for operations and support, including the purchase of not to exceed 117 vehicles for police-type use and hire of passenger motor vehicles; and services as authorized by Section 3109 of Title 5, United States Code; $272,759,000; of which up to $58,874,000 shall remain available until September 30, 2019; of which $29,766,000 shall remain available until September 30, 2022; and of which not to exceed $7,180 shall be for official reception and representation expenses.

Language Provision	Explanation
For necessary expenses of the Federal Law Enforcement Training Centers for operations and support, including the purchase of not to exceed 117 vehicles for police-type use and hire of passenger motor vehicles; and services as authorized by Section 3109 of Title 5, United States Code; $272,759,000; of which up to $58,874,000 shall remain available until September 30, 2019; of which $29,766,000 shall remain available until September 30, 2022; and of which not to exceed $7,180 shall be for official reception and representation expenses.	Dollar change. Moved appropriate language to Title IV administrative provisions and removed duplicative authorization language. No other substantial change proposed.

Federal Law Enforcement Training Center
Reimbursable Resources

Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Change		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Defense - Air Force	**Source**	-	-	$2,904	-	-	$2,915	-	-	$2,915	-	-	-
Operations and Support	Location	-	-	$2,904	-	-	$2,915	-	-	$2,915	-	-	-
Law Enforcement Training	Location	-	-	$2,904	-	-	$2,915	-	-	$2,915	-	-	-
Department of Homeland Security - Transportation Security Administration	**Source**	33	33	$26,164	33	33	$17,308	33	33	$17,308	-	-	-
Operations and Support	Location	33	33	$11,407	33	33	$7,208	33	33	$7,208	-	-	-
Law Enforcement Training	Location	33	33	$11,407	33	33	$7,208	33	33	$7,208	-	-	-
Procurement, Construction, and Improvements	Location	-	-	$14,757	-	-	$10,100	-	-	$10,100	-	-	-
Construction and Facility Improvements	Location	-	-	$14,757	-	-	$10,100	-	-	$10,100	-	-	-
Construction and Facility Improvements End Items	Location	-	-	$14,757	-	-	$10,100	-	-	$10,100	-	-	-
Department of Homeland Security - US Immigration and Customs Enforcement	**Source**	18	18	$5,051	18	18	$6,327	18	18	$29,603	-	-	-
Operations and Support	Location	18	18	$5,004	18	18	$6,327	18	18	$29,603	-	-	-
Law Enforcement Training	Location	18	18	$5,004	18	18	$6,327	18	18	$29,603	-	-	-
Procurement, Construction, and Improvements	Location	-	-	$47	-	-	-	-	-	-	-	-	-
Construction and Facility Improvements	Location	-	-	$47	-	-	-	-	-	-	-	-	-
Construction and Facility Improvements End Items	Location	-	-	$47	-	-	-	-	-	-	-	-	-
Department of Homeland Security - Citizenship and Immigration Services	**Source**	-	-	$414	-	-	-	-	-	-	-	-	-
Procurement, Construction, and Improvements	Location	-	-	$414	-	-	-	-	-	-	-	-	-
Construction and Facility Improvements	Location	-	-	$414	-	-	-	-	-	-	-	-	-
Construction and Facility Improvements End Items	Location	-	-	$414	-	-	-	-	-	-	-	-	-
Department of Homeland Security - Science and Technology	**Source**	-	-	$36,115	-	-	$2,820	-	-	$2,820	-	-	-
Procurement, Construction, and Improvements	Location	-	-	$36,115	-	-	$2,820	-	-	$2,820	-	-	-
Construction and Facility Improvements	Location	-	-	$36,115	-	-	$2,820	-	-	$2,820	-	-	-
Construction and Facility Improvements End Items	Location	-	-	$36,115	-	-	$2,820	-	-	$2,820	-	-	-
Department of Homeland Security - Departmental Management and Operations	**Source**	-	-	$580	-	-	-	-	-	-	-	-	-
Procurement, Construction, and Improvements	Location	-	-	$580	-	-	-	-	-	-	-	-	-
Construction and Facility Improvements	Location	-	-	$580	-	-	-	-	-	-	-	-	-
Construction and Facility Improvements End Items	Location	-	-	$580	-	-	-	-	-	-	-	-	-
Department of Justice - Bureau of Alcohol, Tobacco, Firearms, and Explosives	**Source**	5	5	$4,713	5	5	$4,247	5	5	$4,247	-	-	-
Operations and Support	Location	5	5	$4,713	5	5	$4,247	5	5	$4,247	-	-	-
Law Enforcement Training	Location	5	5	$4,713	5	5	$4,247	5	5	$4,247	-	-	-
Department of Treasury - Internal Revenue Service	**Source**	4	4	$1,383	4	4	$1,338	4	4	$1,338	-	-	-
Operations and Support	Location	4	4	$1,383	4	4	$1,338	4	4	$1,338	-	-	-
Law Enforcement Training	Location	4	4	$1,383	4	4	$1,338	4	4	$1,338	-	-	-
Department of Justice - Federal Prison System	**Source**	-	-	$4,424	-	-	$4,155	-	-	$4,155	-	-	-
Operations and Support	Location	-	-	$4,424	-	-	$4,155	-	-	$4,155	-	-	-
Law Enforcement Training	Location	-	-	$4,424	-	-	$4,155	-	-	$4,155	-	-	-

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Change		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Homeland Security - United States Coast Guard	**Source**	3	3	$4,303	3	3	$4,819	3	3	$4,819	-	-	-
Operations and Support	Location	3	3	$4,303	3	3	$4,819	3	3	$4,819	-	-	-
Law Enforcement Training	Location	3	3	$4,303	3	3	$4,819	3	3	$4,819	-	-	-
Department of Homeland Security - US Customs and Border Protection	**Source**	20	20	$11,651	20	20	$18,392	20	20	$22,964	-	-	-
Operations and Support	Location	20	20	$11,633	20	20	$18,392	20	20	$22,964	-	-	-
Law Enforcement Training	Location	20	20	$11,633	20	20	$18,392	20	20	$22,964	-	-	-
Procurement, Construction, and Improvements	Location	-	-	$18	-	-	-	-	-	-	-	-	-
Construction and Facility Improvements	Location	-	-	$18	-	-	-	-	-	-	-	-	-
Construction and Facility Improvements End Items	Location	-	-	$18	-	-	-	-	-	-	-	-	-
Department of Homeland Security - Analysis and Operations	**Source**	16	16	$1,822	16	16	$1,950	16	16	$1,950	-	-	-
Operations and Support	Location	16	16	$1,822	16	16	$1,950	16	16	$1,950	-	-	-
Law Enforcement Training	Location	16	16	$1,822	16	16	$1,950	16	16	$1,950	-	-	-
Department of State - Department of State	**Source**	-	-	-	-	-	$696	-	-	$696	-	-	-
Operations and Support	Location	-	-	-	-	-	$696	-	-	$696	-	-	-
Law Enforcement Training	Location	-	-	-	-	-	$696	-	-	$696	-	-	-
Department of Interior - Bureau of Indian Affairs and Bureau of Indian Ed	**Source**	3	3	$2,891	3	3	$3,716	3	3	$3,716	-	-	-
Operations and Support	Location	3	3	$2,891	3	3	$3,716	3	3	$3,716	-	-	-
Law Enforcement Training	Location	3	3	$2,891	3	3	$3,716	3	3	$3,716	-	-	-
Department of Homeland Security - Federal Protective Service	**Source**	12	12	$4,285	12	12	$4,792	12	12	$4,792	-	-	-
Operations and Support	Location	12	12	$4,163	12	12	$4,792	12	12	$4,792	-	-	-
Law Enforcement Training	Location	12	12	$4,163	12	12	$4,792	12	12	$4,792	-	-	-
Procurement, Construction, and Improvements	Location	-	-	$122	-	-	-	-	-	-	-	-	-
Construction and Facility Improvements	Location	-	-	$122	-	-	-	-	-	-	-	-	-
Construction and Facility Improvements End Items	Location	-	-	$122	-	-	-	-	-	-	-	-	-
Department of Homeland Security - US Border Patrol	**Source**	7	7	$3,537	7	7	$16,703	7	7	$16,703	-	-	-
Operations and Support	Location	7	7	$3,537	7	7	$16,703	7	7	$16,703	-	-	-
Law Enforcement Training	Location	7	7	$3,537	7	7	$16,703	7	7	$16,703	-	-	-
Pentagon Force Protection Agency	**Source**	-	-	$9	-	-	-	-	-	-	-	-	-
Procurement, Construction, and Improvements	Location	-	-	$9	-	-	-	-	-	-	-	-	-
Construction and Facility Improvements	Location	-	-	$9	-	-	-	-	-	-	-	-	-
Construction and Facility Improvements End Items	Location	-	-	$9	-	-	-	-	-	-	-	-	-
FLETC Partner Agencies - Various	**Source**	90	90	$38,514	132	132	$184,442	132	132	$184,442	-	-	-
Operations and Support	Location	90	90	$38,514	132	132	$72,742	132	132	$72,742	-	-	-
Law Enforcement Training	Location	90	90	$38,514	132	132	$72,742	132	132	$72,742	-	-	-
Procurement, Construction, and Improvements	Location	-	-	-	-	-	$111,700	-	-	$111,700	-	-	-
Construction and Facility Improvements	Location	-	-	-	-	-	$111,700	-	-	$111,700	-	-	-
Construction and Facility Improvements End Items	Location	-	-	-	-	-	$111,700	-	-	$111,700	-	-	-
Total Collections		**211**	**211**	**$148,760**	**253**	**253**	**$274,620**	**253**	**253**	**$302,468**	-	-	-

*Amount displayed for Reimbursable Resources differ from MAX Collect due to timing differences. Adjustments were made to accommodate information not previously available.

FLETC receives reimbursable resources in both the Operations and Support (O&S) and the Procurement, Construction and Improvement (PC&I) appropriations. Reimbursable resources associated with the O&S appropriation constitute reimbursement of training costs incurred by FLETC Partner Organizations as well as supplies and minor construction/renovations falling below the PC&I threshold. Reimbursable resources associated with the PC&I appropriation represent reimbursable construction and/or renovation of training facilities as well as the ongoing construction of the Science and Technology Directorate's National Bio and Agro-Defense Facility.

Department of Homeland Security

Federal Law Enforcement Training Center

Operations and Support

Fiscal Year 2018
Congressional Justification

Table of Contents

Operations and Support

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Mission Support	223	217	$28,075	223	217	$28,034	223	217	$28,034	-	-	-
Law Enforcement Training	910	889	$216,405	872	851	$215,960	916	895	$244,725	44	44	$28,765
Total	**1,133**	**1,106**	**$244,480**	**1,095**	**1,068**	**$243,994**	**1,139**	**1,112**	**$272,759**	**44**	**44**	**$28,765**
Subtotal Discretionary - Appropriation	1,133	1,106	$244,480	1,095	1,068	$243,994	1,139	1,112	$272,759	44	44	$28,765

Overview

The Federal Law Enforcement Training Centers' (FLETC) Operations and Support (O&S) appropriation is critical to ensuring it 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 (PPA): Law Enforcement Training (LET) and Mission Support, each providing vital support to FLETC's mission. The Fiscal Year (FY) 2018 Budget proposes an increase of $29.0 million and 44 FTE in tuition and training costs, which are attributed to the basic training requirements of the President's Executive Orders (EO) on Border Security and Immigration Enforcement Improvements and Enhancing Public Safety in the Interior of the United States. The Budget also reflects $235,000 in WCF transfers.

- **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. This PPA also provides for salaries, travel, and supplies necessary for maintaining and executing a quality and efficient accreditation process. Moreover, the LET PPA provides minor construction and maintenance, environmental compliance, and communications systems funding.

- **Mission Support:** FLETC's Mission Support PPA provides for salaries, travel, equipment, and supplies necessary for mission support activities, such as budget, finance, procurement and other administrative support activities.

Operations and Support
Budget Authority and Obligations
Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$245,038		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	($558)		
Revised Enacted/Request	**$244,480**	**$243,994**	**$272,759**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$31,384	$16,838	$5,000
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$275,864**	**$260,832**	**$277,759**
Collections – Reimbursable Resources	$96,698	$150,000	$177,848
Total Budget Resources	**$372,562**	**$410,832**	**$455,607**
Obligations (Actual/Projections/Estimates)	$231,075	$252,034	$273,000
Personnel: Positons and FTE			
Enacted/Request Positions	1,133	1,095	1,139
Enacted/Request FTE	1,106	1,068	1,112
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	1,057	1,348	1,392
FTE (Actual/Estimates/Projections)	964	1,321	1,365

The budget authority and obligations table presents FLETC's total budget authority and anticipated execution. As such, reimbursable authority of $177.8 million and 253 FTE are requested in FY 2018. FY 2017 and FY 2018 Onboard and FTE reflect both direct and reimbursable funded authorized/requested positions and FTE.

Operations and Support
Collections – Reimbursable Resources
Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Defense - Air Force	Source	-	-	$2,904	-	-	$2,915	-	-	$2,915
Department of Homeland Security - Transportation Security Administration	Source	33	33	$11,407	33	33	$7,208	33	33	$7,208
Department of Homeland Security - US Immigration and Customs Enforcement	Source	18	18	$5,004	18	18	$6,327	18	18	$29,603
Department of Justice - Bureau of Alcohol, Tobacco, Firearms, and Explosives	Source	5	5	$4,713	5	5	$4,247	5	5	$4,247
Department of Treasury - Internal Revenue Service	Source	4	4	$1,383	4	4	$1,338	4	4	$1,338
Department of Justice - Federal Prison System	Source	-	-	$4,424	-	-	$4,155	-	-	$4,155
Department of Homeland Security - United States Coast Guard	Source	3	3	$4,303	3	3	$4,819	3	3	$4,819
Department of Homeland Security - US Customs and Border Protection	Source	20	20	$11,633	20	20	$18,392	20	20	$22,964
Department of Homeland Security - Analysis and Operations	Source	16	16	$1,822	16	16	$1,950	16	16	$1,950
Department of State - Department of State	Source	-	-	-	-	-	$696	-	-	$696
Department of Interior - Bureau of Indian Affairs and Bureau of Indian Ed	Source	3	3	$2,891	3	3	$3,716	3	3	$3,716
Department of Homeland Security - Federal Protective Service	Source	12	12	$4,163	12	12	$4,792	12	12	$4,792
Department of Homeland Security - US Border Patrol	Source	7	7	$3,537	7	7	$16,703	7	7	$16,703
FLETC Partner Agencies - Various	Source	90	90	$38,514	132	132	$72,742	132	132	$72,742
Total Collections		**211**	**211**	**$96,698**	**253**	**253**	**$150,000**	**253**	**253**	**$177,848**

Operations and Support
Summary of Budget Changes
Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**1,133**	**1,106**	**$245,038**
FY16 Rescission	-	-	($558)
Total Rescissions	**-**	**-**	**($558)**
FY 2016 Revised Enacted	**1,133**	**1,106**	**$244,480**
FY 2017 Annualized CR	**1,095**	**1,068**	**$243,994**
FY 2018 Base Budget	**1,095**	**1,068**	**$243,994**
Transfer to A&O from FLETC/LET due to A&O WCF Activity Costs Removal	-	-	($2)
Transfer to USM/CHCO from FLETC/LET due to CPO WCF Activity Costs Removal	-	-	($42)
Transfer to USM/CHCO from FLETC/MS due to CPO WCF Activity Costs Removal	-	-	($4)
Transfer to USM/CIO from FLETC/LET due to CSO WCF Activity Costs Removal	-	-	($50)
Transfer to USM/CPO from FLETC/LET due to CHCO WCF Activity Costs Removal	-	-	($86)
Transfer to USM/CRSO from FLETC/MS due to CRSO WCF Activity Costs Removal	-	-	($1)
Transfer to USM/CSO from FLETC/LET due to CIO WCF Activity Costs Removal	-	-	($47)
Transfer to USM/OGC from FLETC/LET due to CHCO WCF Activity Costs Removal	-	-	($3)
Total Transfers	**-**	**-**	**($235)**
2018 Pay Raise	-	-	$1,834
Annualization of 2017 Pay Raise	-	-	$417
Total, Pricing Increases	**-**	**-**	**$2,251**
Operating Efficiencies	-	-	($2,251)
Total, Pricing Decreases	**-**	**-**	**($2,251)**
Total Adjustments-to-Base	**-**	**-**	**($235)**
FY 2018 Current Services	**1,095**	**1,068**	**$243,759**
Execution of Executive Orders for 1,000 ICE Officers and 500 CBP Officers	44	44	$29,000
Total, Program Increases	**44**	**44**	**$29,000**
FY 2018 Request	**1,139**	**1,112**	**$272,759**
FY 2017 TO FY 2018 Change	**44**	**44**	**$28,765**

Operations and Support
Justification of Pricing Changes

Dollars in Thousands

Pricing Changes	FY 2018 President's Budget		
	Positions	FTE	Amount
Pricing Change 1 - 2018 Pay Raise	-	-	**$1,834**
Mission Support	-	-	$366
Law Enforcement Training	-	-	$1,468
Pricing Change 2 - Annualization of 2017 Pay Raise	-	-	**$417**
Mission Support	-	-	$83
Law Enforcement Training	-	-	$334
Pricing Change 3 - Operating Efficiencies	-	-	**($2,251)**
Mission Support	-	-	($444)
Law Enforcement Training	-	-	($1,807)
Total Pricing Changes	-	-	-

FY 2018 Pay Raise: Absorption of the FY 2018 Pay Raise results in a price increase of $1.8 million.

Annualization of FY 2017 Pay Raise: Annualizing the FY 2017 Pay Raise results in a price increase of $417,000.

Operating Efficiencies: As a result of absorption of the FY 2018 pay raise, FLETC will undergo further reductions similar to those in the past. Staff training and travel along with service contracts will be reduced. Administrative support contracts will take a larger reduction due to the increase in the training workload. FLETC will also undergo further reductions to supplies, equipment and continued deferred maintenance for a total decrease of ($2.3 million).

Operations and Support
Justification of Program Changes
Dollars in Thousands

Program Changes	FY 2018 President's Budget		
	Positions	FTE	Amount
Program Change 1 - Execution of Executive Orders for 1,000 ICE Officers and 500 CBP Officers	**44**	**44**	**$29,000**
Law Enforcement Training	44	44	$29,000
Total Program Changes	**44**	**44**	**$29,000**

Program Change
Execution of Executive Order Training
Description

FLETC's O&S LET PPA provides base level funding for basic students. In order to provide the basic training required to support the President's plan to strengthen border security and immigration enforcement, FLETC requires $29.0 million in additional resources, to include Basic Training funds, necessary facilities and IT infrastructure, and 44 additional FTE.

Justification

The FY 2018 budget provides funds to recruit and hire 500 new Border Patrol Agents and 1,000 new Immigration and Customs Enforcement law enforcement personnel. This training directly supports execution of the President's agenda and strengthens the ability of the Nation's law enforcement agencies to protect the homeland.

Performance

The addition to the base level funding will ensure that FLETC is able to meet the President's plan to strengthen border security and immigration enforcement.

Operations and Support
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Mission Support	223	217	$25,582	$117.15	223	217	$25,545	$116.98	223	217	$25,994	$119.03	-	-	$449	$2.05
Law Enforcement Training	910	889	$104,197	$117.2	872	851	$102,689	$120.66	916	895	$109,275	$122.09	44	44	$6,586	$1.43
Total	**1,133**	**1,106**	**$129,779**	**$117.19**	**1,095**	**1,068**	**$128,234**	**$119.91**	**1,139**	**1,112**	**$135,269**	**$121.49**	**44**	**44**	**$7,035**	**$1.58**
Discretionary - Appropriation	1,133	1,106	$129,779	$117.19	1,095	1,068	$128,234	$119.91	1,139	1,112	$135,269	$121.49	44	44	$7,035	$1.58

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

The increase is due to the addition of 44 FTE to deliver necessary training associated with the President's Executive Orders on Border Security and Immigration Enforcement Improvements and Enhancing Public Safety in the Interior of the United States in addition to the annualization of the FY 2017 pay raise and the FY 2018 pay raise result in the increase of $7.0 million.

Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$88,525	$87,486	$92,232	$4,746
11.3 Other than Full-Time Permanent	$1,476	$1,455	$1,547	$92
11.5 Other Personnel Compensation	$4,778	$4,721	$4,982	$261
11.8 Special Personal Services Payments	$15	$15	$15	-
12.1 Civilian Personnel Benefits	$34,831	$34,403	$36,336	$1,933
13.0 Benefits for Former Personnel	$154	$154	$157	$3
Total - Personnel Compensation and Benefits	**$129,779**	**$128,234**	**$135,269**	**$7,035**
Positions and FTE				
Positions - Civilian	1,133	1,095	1,139	44
FTE - Civilian	1,106	1,068	1,112	44

*Amount displayed for Pay Object class differ from MAX Collect due to adjustments made to pay amount to accurately reflect execution of requested direct FTE.

Operations and Support
Permanent Positions by Grade – Appropriation

Grades and Salary Range	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
Total, SES	10	11	11	-
GS-15	84	80	80	-
GS-14	136	129	136	7
GS-13	346	330	354	24
GS-12	288	283	294	11
GS-11	87	90	92	2
GS-9	80	73	73	-
GS-8	30	31	31	-
GS-7	15	14	14	-
GS-6	3	1	1	-
GS-5	3	2	2	-
GS-4	3	2	2	-
Other Graded Positions	48	49	49	-
Total Permanent Positions	**1,133**	**1,095**	**1,139**	**44**
Position Locations				
Headquarters	897	859	894	35
U.S. Field	234	234	243	9
Foreign Field	2	2	2	-
Averages				
Average Personnel Costs, ES Positions	165,688	171,666	174,928	3,262
Average Personnel Costs, GS Positions	90,223	91,957	93,704	1,747
Average Grade, GS Positions	12	12	12	-

Operations and Support
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Mission Support	$2,493	$2,489	$2,040	($449)
Law Enforcement Training	$112,208	$113,271	$135,450	$22,179
Total	**$114,701**	**$115,760**	**$137,490**	**$21,730**
Discretionary - Appropriation	$114,701	$115,760	$137,490	$21,730

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$3,243	$3,288	$3,818	$530
22.0 Transportation of Things	$628	$640	$680	$40
23.2 Rental Payments to Others	$6	$6	$6	-
23.3 Communications, Utilities, and Misc. Charges	$7,126	$7,280	$7,908	$628
24.0 Printing and Reproduction	$699	$699	$1,030	$331
25.1 Advisory and Assistance Services	$1,589	$1,597	$1,829	$232
25.2 Other Services from Non-Federal Sources	$13,770	$13,874	$17,860	$3,986
25.3 Other Goods and Services from Federal Sources	$4,959	$5,073	$5,223	$150
25.4 Operation and Maintenance of Facilities	$31,170	$31,477	$40,236	$8,759
25.6 Medical Care	$3,163	$3,190	$4,196	$1,006
25.7 Operation and Maintenance of Equipment	$6,122	$6,274	$6,451	$177
25.8 Subsistence & Support of Persons	$565	$545	$766	$221
26.0 Supplies and Materials	$13,142	$13,168	$18,811	$5,643
31.0 Equipment	$6,857	$7,023	$7,134	$111
32.0 Land and Structures	$21,654	$21,618	$21,535	($83)
42.0 Insurance Claims and Indemnities	$7	$7	$6	($1)
43.0 Interest and Dividends	$1	$1	$1	-
Total - Non Pay Object Classes	**$114,701**	**$115,760**	**$137,490**	**$21,730**

*Amount displayed for Non-Pay Object class differ from MAX Collect due to adjustments made to non-pay amount to accurately reflect execution of requested budgetary resources.

Mission Support – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Mission Support	223	217	$28,075	223	217	$28,034	223	217	$28,034	-	-	-
Total	**223**	**217**	**$28,075**	**223**	**217**	**$28,034**	**223**	**217**	**$28,034**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	223	217	$28,075	223	217	$28,034	223	217	$28,034	-	-	-

Mission Support – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$28,075		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$28,075**	**$28,034**	**$28,034**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$28,075**	**$28,034**	**$28,034**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$28,075**	**$28,034**	**$28,034**
Obligations (Actual/Projections/Estimates)	$28,075	$28,034	$28,034
Personnel: Positons and FTE			
Enacted/Request Positions	223	223	223
Enacted/Request FTE	217	217	217
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	194	223	223
FTE (Actual/Estimates/Projections)	189	217	217

Mission Support

The Mission Support PPA provides funding for administrative support personnel salaries and benefits, which comprises 93 percent of this total program. In addition to salaries and benefits, Mission Support 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 MS requirements.

Funding requested in the Mission Support PPA supports current services and is allocated as follows:

- Salaries and Benefits (S&B) – $26.0 million and 217 FTE, 93 percent of the total PPA.
  - Administrative offices – Procurement, Human Capital, Environmental and Safety and Asset Management – $12.9 million and 108 FTE, 50 percent of FLETC's S&B.
  - Management offices – Protocol and Communications, Office of Chief Counsel, Washington Office and Office of Organizational Health and Inspection and Compliance Division – $7.3 million and 61 FTE, 28 percent of FLETC's S&B.
  - Financial Management – Budget and Finance – $5.8 million and 48 FTE, 22 percent of FLETC's S&B.
- Supplies, Services, Equipment and other MS requirements – $1.8 million and 0 FTE, 6 percent of the total PPA.
- Travel – $264,000 and 0 FTE, 1 percent of the total PPA.

Mission Support – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**223**	**217**	**$28,075**
FY 2016 Revised Enacted	**223**	**217**	**$28,075**
FY 2017 Annualized CR	**223**	**217**	**$28,034**
FY 2018 Base Budget	**223**	**217**	**$28,034**
Transfer to USM/CHCO from FLETC/MS due to CPO WCF Activity Costs Removal	-	-	($4)
Transfer to USM/CRSO from FLETC/MS due to CRSO WCF Activity Costs Removal	-	-	($1)
Total Transfers	**-**	**-**	**($5)**
2018 Pay Raise	-	-	$366
Annualization of 2017 Pay Raise	-	-	$83
Total, Pricing Increases	**-**	**-**	**$449**
Operating Efficiencies	-	-	($444)
Total, Pricing Decreases	**-**	**-**	**($444)**
FY 2018 Current Services	**223**	**217**	**$28,034**
FY 2018 Request	**223**	**217**	**$28,034**
FY 2017 TO FY 2018 Change	**-**	**-**	**-**

PPA Description

- **Mission Support:** FLETC's Mission Support PPA provides for salaries, travel, equipment, and supplies necessary for mission support activities, such as budget, finance, procurement and other administrative support activities.

Adjustments to Base Justification

- Working Capital Fund transfers result in a decrease of $5,000 in the Mission Support PPA
- Annualization of the FY 2017 pay raise and the FY 2018 pay raise result in an increase of $449,000 in the Mission Support PPA
- Operating efficiencies result in a decrease of $444,000 in the Mission Support PPA

Mission Support – PPA
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Mission Support	223	217	$25,582	$117.15	223	217	$25,545	$116.98	223	217	$25,994	$119.03	-	-	$449	$2.05
Total	**223**	**217**	**$25,582**	**$117.15**	**223**	**217**	**$25,545**	**$116.98**	**223**	**217**	**$25,994**	**$119.03**	**-**	**-**	**$449**	**$2.05**
Discretionary - Appropriation	223	217	$25,582	$117.15	223	217	$25,545	$116.98	223	217	$25,994	$119.03	-	-	$449	$2.05

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

The increase of $449,000 in the Mission Support PPA is due to the annualization of the FY 2017 pay raise and the FY 2018 pay raise.

Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$18,612	$18,585	$18,912	$327
11.3 Other than Full-Time Permanent	$22	$22	$22	-
11.5 Other Personnel Compensation	$880	$879	$894	$15
11.8 Special Personal Services Payments	$7	$7	$7	-
12.1 Civilian Personnel Benefits	$5,907	$5,898	$6,002	$104
13.0 Benefits for Former Personnel	$154	$154	$157	$3
Total - Personnel Compensation and Benefits	**$25,582**	**$25,545**	**$25,994**	**$449**
Positions and FTE				
Positions - Civilian	223	223	223	-
FTE - Civilian	217	217	217	-

Mission Support – PPA
Pay Cost Drivers

Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 President's Budget			FY 2018 Request			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Pay & Benefits	217	$25,582	$117	217	25,545	$117	217	25,994	$119	0	$449	$2
Total Pay Cost Drivers												

NARRATIVE EXPLANATION OF CHANGES

Pay Cost Drivers

FTE Change FY 2017-2018: There is no FTE change from FY 2017 to FY 2018
PCB Change FY 2017-2018: The addition of $449,000 in pay is attributed to the annualization of the FY 2017 pay raise and the FY 2018 pay raise.
Average Cost Change FY 2017-2018: Average cost per FTE increased due to the annualization of the FY 2017 pay raise and the FY 2018 pay raise.

Mission Support – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Mission Support	$2,493	$2,489	$2,040	($449)
Total	**$2,493**	**$2,489**	**$2,040**	**($449)**
Discretionary - Appropriation	$2,493	$2,489	$2,040	($449)

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$322	$322	$264	($58)
22.0 Transportation of Things	$64	$64	$53	($11)
23.3 Communications, Utilities, and Misc. Charges	$4	$4	$3	($1)
25.1 Advisory and Assistance Services	$554	$553	$454	($99)
25.2 Other Services from Non-Federal Sources	$1,030	$1,028	$842	($186)
25.3 Other Goods and Services from Federal Sources	$236	$236	$193	($43)
25.4 Operation and Maintenance of Facilities	$10	$10	$8	($2)
25.6 Medical Care	$23	$23	$19	($4)
25.7 Operation and Maintenance of Equipment	$37	$37	$30	($7)
25.8 Subsistence & Support of Persons	$10	$10	$8	($2)
26.0 Supplies and Materials	$140	$140	$114	($26)
31.0 Equipment	$56	$55	$46	($9)
42.0 Insurance Claims and Indemnities	$7	$7	$6	($1)
Total - Non Pay Object Classes	**$2,493**	**$2,489**	**$2,040**	**($449)**

Mission Support-PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 President's Budget	FY 2018 Request	FY 2017 to FY 2018 Total Changes
Support Contracts	$1,900	$1,897	$1,555	$(342)
Staff Travel	$322	$322	$264	$(58)
Supplies and Materials	$140	$140	$114	$(26)
Equipment	$56	$55	$46	$(9)
Transportation	$64	$64	$53	$(11)
Other Costs	$11	$11	$8	$(3)
Total – Non Pay Cost Drivers	**$2,493**	**$2,489**	**$2,040**	**$(449)**

NARRATIVE EXPLANATION OF CHANGES

Support contracts must be reduced by $342,000 in order to absorb the annualization of the FY 2017 pay raise and the FY 2018 pay raise

Staff travel must be reduced by $58,000 in order to absorb the annualization of the FY 2017 pay raise and the FY 2018 pay raise

Supplies and materials must be reduced by $26,000 in order to absorb the annualization of the FY 2017 pay raise and the FY 2018 pay raise

Equipment must be reduced by $9,000 in order to absorb the annualization of the FY 2017 pay raise and the FY 2018 pay raise

Transportation must be reduced by $11,000 in order to absorb the annualization of the FY 2017 pay raise and the FY 2018 pay raise

Law Enforcement Training - PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Law Enforcement Training	910	889	$216,405	872	851	$215,960	916	895	$244,725	44	44	$28,765
Total	**910**	**889**	**$216,405**	**872**	**851**	**$215,960**	**916**	**895**	**$244,725**	**44**	**44**	**$28,765**
Subtotal Discretionary - Appropriation	910	889	$216,405	872	851	$215,960	916	895	$244,725	44	44	$28,765

*2016 Revised Enacted Carryover - Start of Year includes $3.576M of Spectrum funds. 2017 Annualized CR Carryover - Start of Year includes $3.235M of Spectrum funds.

Law Enforcement Training – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$216,963		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	($558)		
Revised Enacted/Request	**$216,405**	**$215,960**	**$244,725**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$31,384	$16,838	$5,000
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$247,789**	**$232,798**	**$249,725**
Collections – Reimbursable Resources	$96,698	$150,000	$177,848
Total Budget Resources	**$344,487**	**$382,798**	**$427,573**
Obligations (Actual/Projections/Estimates)	$203,000	$224,000	$244,966
Personnel: Positons and FTE			
Enacted/Request Positions	910	872	916
Enacted/Request FTE	889	851	895
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	863	1,125	1,169
FTE (Actual/Estimates/Projections)	775	1,104	1,148

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 15,100 basic students. LET is funded to provide tuition and 50 percent of the instructor requirements for basic training, and 50 percent 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. 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:

The LET PPA provides for the following:

- $109.3 million for salaries and benefits for 895 FTE within 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, annualization of the 2017 pay raise and FY 2018 OMB approved pay raise.
- $58.9 million for tuition and overhead costs associated with Basic Law Enforcement Training for 15,406 projected students and 93,429 projected student weeks.
- $29.8 million for minor construction and maintenance, which provides alterations and maintenance for approximately 300 buildings at four geographically distinct sites for projects such as:
    - Additional modular office spaces and training venues to comply with Executive Orders
    - 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
    - Communications systems funding to repair and maintain or replace the fiber optics telecommunications cable system
    - Environmental compliance, which ensures compliance with the Environmental Protection Agency and State environmental laws and regulations
- $43.2 million for Supplies, Services, Equipment and other O&S requirements.
- $2.3 million for official staff travel and PCS.
- $1.3 million for salaries, travel, and supplies necessary for maintaining and executing FLETC's accreditation process.

Law Enforcement Training - PPA
Collections – Reimbursable Resources

Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Defense - Air Force	Source	-	-	$2,904	-	-	$2,915	-	-	$2,915
Department of Homeland Security - Transportation Security Administration	Source	33	33	$11,407	33	33	$7,208	33	33	$7,208
Department of Homeland Security - US Immigration and Customs Enforcement	Source	18	18	$5,004	18	18	$6,327	18	18	$29,603
Department of Justice - Bureau of Alcohol, Tobacco, Firearms, and Explosives	Source	5	5	$4,713	5	5	$4,247	5	5	$4,247
Department of Treasury - Internal Revenue Service	Source	4	4	$1,383	4	4	$1,338	4	4	$1,338
Department of Justice - Federal Prison System	Source	-	-	$4,424	-	-	$4,155	-	-	$4,155
Department of Homeland Security - United States Coast Guard	Source	3	3	$4,303	3	3	$4,819	3	3	$4,819
Department of Homeland Security - US Customs and Border Protection	Source	20	20	$11,633	20	20	$18,392	20	20	$22,964
Department of Homeland Security - Analysis and Operations	Source	16	16	$1,822	16	16	$1,950	16	16	$1,950
Department of State - Department of State	Source	-	-	-	-	-	$696	-	-	$696
Department of Interior - Bureau of Indian Affairs and Bureau of Indian Ed	Source	3	3	$2,891	3	3	$3,716	3	3	$3,716
Department of Homeland Security - Federal Protective Service	Source	12	12	$4,163	12	12	$4,792	12	12	$4,792
Department of Homeland Security - US Border Patrol	Source	7	7	$3,537	7	7	$16,703	7	7	$16,703
FLETC Partner Agencies - Various	Source	90	90	$38,514	132	132	$72,742	132	132	$72,742
Total Collections		**211**	**211**	**$96,698**	**253**	**253**	**$150,000**	**253**	**253**	**$177,848**

Law Enforcement Training - PPA
Summary of Budget Changes
Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**910**	**889**	**$216,963**
FY16 Rescission	-	-	($558)
Total Rescissions	**-**	**-**	**($558)**
FY 2016 Revised Enacted	**910**	**889**	**$216,405**
FY 2017 Annualized CR	**872**	**851**	**$215,960**
FY 2018 Base Budget	**872**	**851**	**$215,960**
Transfer to A&O from FLETC/LET due to A&O WCF Activity Costs Removal	-	-	($2)
Transfer to USM/CHCO from FLETC/LET due to CPO WCF Activity Costs Removal	-	-	($42)
Transfer to USM/CIO from FLETC/LET due to CSO WCF Activity Costs Removal	-	-	($50)
Transfer to USM/CPO from FLETC/LET due to CHCO WCF Activity Costs Removal	-	-	($86)
Transfer to USM/CSO from FLETC/LET due to CIO WCF Activity Costs Removal	-	-	($47)
Transfer to USM/OGC from FLETC/LET due to CHCO WCF Activity Costs Removal	-	-	($3)
Total Transfers	**-**	**-**	**($230)**
2018 Pay Raise	-	-	$1,468
Annualization of 2017 Pay Raise	-	-	$334
Total, Pricing Increases	**-**	**-**	**$1,802**
Operating Efficiencies	-	-	($1,807)
Total, Pricing Decreases	**-**	**-**	**($1,807)**
Total Adjustments-to-Base	**-**	**-**	**($235)**
FY 2018 Current Services	**872**	**851**	**$215,725**
Execution of Executive Orders for 1,000 ICE Officers and 500 CBP Officers	44	44	$29,000
Total, Program Increases	**44**	**44**	**$29,000**
FY 2018 Request	**916**	**895**	**$244,725**
FY 2017 TO FY 2018 Change	**44**	**44**	**$28,765**

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. This PPA also provides for salaries, travel, and supplies necessary for maintaining and executing a quality and efficient accreditation process. Moreover, the LET PPA provides minor construction and maintenance, environmental compliance, and communications systems funding.

Adjustments to Base Justification

- Working Capital Fund transfers result in a decrease of $230,000 in the LET PPA
- Annualization of the FY 2017 pay raise and the FY 2018 pay raise result in an increase of $1.8 million in the LET PPA
- Operating efficiencies result in a decrease of $1.8 million in the LET PPA

Law Enforcement Training - PPA
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Law Enforcement Training	910	889	$104,197	$117.2	872	851	$102,689	$120.66	916	895	$109,275	$122.09	44	44	$6,586	$1.43
Total	**910**	**889**	**$104,197**	**$117.2**	**872**	**851**	**$102,689**	**$120.66**	**916**	**895**	**$109,275**	**$122.09**	**44**	**44**	**$6,586**	**$1.43**
Discretionary - Appropriation	910	889	$104,197	$117.2	872	851	$102,689	$120.66	916	895	$109,275	$122.09	44	44	$6,586	$1.43

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$69,913	$68,901	$73,320	$4,419
11.3 Other than Full-Time Permanent	$1,454	$1,433	$1,525	$92
11.5 Other Personnel Compensation	$3,898	$3,842	$4,088	$246
11.8 Special Personal Services Payments	$8	$8	$8	-
12.1 Civilian Personnel Benefits	$28,924	$28,505	$30,334	$1,829
Total - Personnel Compensation and Benefits	**$104,197**	**$102,689**	**$109,275**	**$6,586**
Positions and FTE				
Positions - Civilian	910	872	916	44
FTE - Civilian	889	851	895	44

Law Enforcement Training - PPA
Pay Cost Drivers

Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 President's Budget			FY 2018 Request			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Pay & Benefits	889	$104,197	$117	851	$102,689	$121	895	$109,275	$122	44	$6,586	$1
Total – Pay Cost Drivers	**889**	**$104,197**	**$117**	**851**	**$102,689**	**$121**	**895**	**$109,275**	**$122**	**44**	**$6,586**	**$1**

NARRATIVE EXPLANATION OF CHANGES

FTE Change FY 2017-2018: An FY 2018 increase of 44 FTE is requested to deliver necessary training associated with the President's Executive Orders on Border Security and Immigration Enforcement Improvements and Enhancing Public Safety in the Interior of the United States

PCB Change FY 2017-2018: 44 additional FTE and the annualization of the FY 2017 pay raise and the FY 2018 pay raise result in an increase of $6.6 million

Average Cost Change FY 2017-2018: Average cost increased by $1,000 as a result of annualization and the FY 2018 pay raise.

Law Enforcement Training - PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Law Enforcement Training	$112,208	$113,271	$135,450	$22,179
Total	**$112,208**	**$113,271**	**$135,450**	**$22,179**
Discretionary - Appropriation	$112,208	$113,271	$135,450	$22,179

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$2,921	$2,966	$3,554	$588
22.0 Transportation of Things	$564	$576	$627	$51
23.2 Rental Payments to Others	$6	$6	$6	-
23.3 Communications, Utilities, and Misc. Charges	$7,122	$7,276	$7,905	$629
24.0 Printing and Reproduction	$699	$699	$1,030	$331
25.1 Advisory and Assistance Services	$1,035	$1,044	$1,375	$331
25.2 Other Services from Non-Federal Sources	$12,740	$12,846	$17,018	$4,172
25.3 Other Goods and Services from Federal Sources	$4,723	$4,837	$5,030	$193
25.4 Operation and Maintenance of Facilities	$31,160	$31,467	$40,228	$8,761
25.6 Medical Care	$3,140	$3,167	$4,177	$1,010
25.7 Operation and Maintenance of Equipment	$6,085	$6,237	$6,421	$184
25.8 Subsistence & Support of Persons	$555	$535	$758	$223
26.0 Supplies and Materials	$13,002	$13,028	$18,697	$5,669
31.0 Equipment	$6,801	$6,968	$7,088	$120
32.0 Land and Structures	$21,654	$21,618	$21,535	($83)
43.0 Interest and Dividends	$1	$1	$1	-
Total - Non Pay Object Classes	**$112,208**	**$113,271**	**$135,450**	**$22,179**

Law Enforcement Training - PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 President's Budget	FY 2018 Request	FY 2017 to FY 2018 Total Changes
Basic Training Funds	$38,981	$38,907	$58,874	$19,967
Support Contracts	$35,114	$35,036	$36,451	$1,415
Land & Structures	$21,654	$21,624	$21,535	$(89)
Communications/Utilities	$7,122	$6,132	$6,761	$629
Supplies and Materials	$2,255	$2,239	$2,476	$237
Other Costs	$7,082	$9,333	9,353	$20
Total – Non Pay Cost Drivers	**$112,208**	**$113,271**	**$135,450**	**$22,179**

NARRATIVE EXPLANATION OF CHANGES

- **Basic Training Funds –** The tuition and training costs for basic training 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. The increase of $20.0 million in tuition and training costs is attributed to the basic training requirements of the President's Executive Orders on Border Security and Immigration Enforcement Improvements and Enhancing Public Safety in the Interior of the United States.
- **Support Contracts –** The increase of $1.4 million in the support contracts is attributed to the increased support requirements associated with President's Executive Orders. The FY 2018 Budget for support contracts consists of services such as:
    - Security $10.4 million
    - Field Office Support Contracts (FOSS) $8.9 million
    - Janitorial $7.2 million
    - Facilities and ground maintenance $2.5 million
    - Role players $4.6 million
    - Transportation $1.8 million
    - Other $1.1 million

- **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 $21.5 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 2018 requirements are inclusive of the requirements associated with President's Executive Orders.
  - Minor Construction and Maintenance at each site:
    - Glynco $ 5 million
    - Artesia $ 4 million
    - Charleston $ 3 million
    - Cheltenham $ 3 million
  - Front gate security enhancements $ 1.4 million
  - Roof repairs/replacements $ 1.8 million
  - Bld. 261/Bldg. 263 renovations $ 1.1 million
  - Modular classrooms/training venues for EO $ 2.2 million

- **Rental Payments, Communications and Utilities –** The increase of $629,000 is attributed to increased requirements associated with President's Executive Orders. The FY 2018 Budget consists of services such as:
  - Utilities, i.e. electricity, water, sewer $5.9 million
  - Cellular and wireless services $550,000
  - Rental payments $8,000

- **Supplies -** The increase of $237,000 is attributed to increased requirements associated with President's Executive Orders.

Department of Homeland Security

Federal Law Enforcement Training Center

Procurement, Construction, and Improvements

Fiscal Year 2018
Congressional Justification

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Procurement, Construction, and Improvements
Budget Comparison and Adjustments
Budget Authority and Obligations
Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	-		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**-**	**-**	**-**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$492	$17,147	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$492**	**$17,147**	**-**
Collections – Reimbursable Resources	$52,062	$124,620	$124,620
Total Budget Resources	**$52,554**	**$141,767**	**$124,620**
Obligations (Actual/Projections/Estimates)	$26,000	$17,147	-
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE Including Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

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 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.

Although FLETC does not have a PC&I appropriations request for FY 2018, this submission is provided to reflect receipt of reimbursements for FY 2016 and FY 2017. FLETC anticipates future year submissions, will include PC&I requests.

The budget authority and obligations table presents FLETC's total reimbursable authority and anticipated execution. FLETC does not have a direct PC&I budget request. As such, FLETC anticipates reimbursable authority of $124.6 million in FY 2018.

Procurement, Construction, and Improvements
Collections – Reimbursable Resources

Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Homeland Security - Transportation Security Administration	Source	-	-	$14,757	-	-	$10,100	-	-	$10,100
Department of Homeland Security - US Immigration and Customs Enforcement	Source	-	-	$47	-	-	-	-	-	-
Department of Homeland Security - Citizenship and Immigration Services	Source	-	-	$414	-	-	-	-	-	-
Department of Homeland Security - Science and Technology	Source	-	-	$36,115	-	-	$2,820	-	-	$2,820
Department of Homeland Security - Departmental Management and Operations	Source	-	-	$580	-	-	-	-	-	-
Department of Homeland Security - US Customs and Border Protection	Source	-	-	$18	-	-	-	-	-	-
Department of Homeland Security - Federal Protective Service	Source	-	-	$122	-	-	-	-	-	-
Pentagon Force Protection Agency	Source	-	-	$9	-	-	-	-	-	-
FLETC Partner Agencies - Various	Source	-	-	-	-	-	$111,700	-	-	$111,700
Total Collections		**-**	**-**	**$52,062**	**-**	**-**	**$124,620**	**-**	**-**	**$124,620**

Department of Homeland Security

Science and Technology

Budget Overview

Fiscal Year 2018

Congressional Justification

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Science and Technology

Appropriation Organization Structure

Organization Name	Level	Fund Type (* Includes Defense Funding)
Science and Technology	**Component**	
Operations and Support	**Appropriation**	
Mission Support	PPA	Discretionary - Appropriation
Laboratory Facilities	PPA	Discretionary - Appropriation
Acquisition and Operations Analysis	PPA	Discretionary - Appropriation
Procurement, Construction, and Improvements	**Appropriation**	
Laboratory Facilities	PPA	Discretionary - Appropriation
Research and Development	**Appropriation**	
Research, Development and Innovation	PPA	Discretionary - Appropriation
University Programs	PPA	Discretionary - Appropriation

Science and Technology
Strategic Context

Component Overview

The Science & Technology (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: The Acquisition and Operations Analysis programs provide expert assistance to entities across the homeland security enterprise to ensure that the transition, acquisition, and deployment of technologies and information improve the efficiency and effectiveness of operational capabilities across the homeland security enterprise. This program assists in testing and evaluation, standards development, requirements analysis, systems engineering, and supporting technology transition.

Laboratory Facilities: The Laboratory Facilities program oversees a coordinated network of five DHS laboratories and as many as 13 Department of Energy laboratories that are vital to the homeland security mission. This network enables scientists and engineers to apply their expertise and develop solutions that address homeland security related threats and vulnerabilities.

Research, Development, and Innovation: Research, Development, and Innovation is a portfolio of customer-focused and output-oriented research, development, testing and evaluation programs. The program consists of specific portfolios to include: Border Security, Chemical/Biological/ Explosives Defense, Cyber Security/Information Analysis, Counter Terrorist, and First Responder/Disaster Resilience. These portfolios support the needs of the operational components of the Department and the first responder community to address capability gaps.

University Programs: University Programs streamlines access to the expertise of the nation's colleges and universities to address pressing homeland security needs. 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.

Mission Support: The Mission Support program provides enterprise leadership, management, and business administrative services that sustain the day-to-day back office operations. Key capabilities include managing the agency's performance, finances, workforce, physical and personnel security, acquisition of goods and services, information technology, property and assets, communications, legal affairs, and administration.

Component Contributions to Achieving Departmental Missions

The table below shows the alignment of the S&T 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					19%	81%
Laboratory Facilities						100%
Research, Development, and Innovation	41%	16%		17%	21%	5%
University Programs						100%
Mission Support						100%

**Totals account for rounding*

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 Name	FY 2016 Revised Enacted		FY 2017 Annualized CR		FY 2018 President's Budget	
	$	FTE	$	FTE	$	FTE
Research, Development, and Innovation	187,819	-	176,495	-	141,692	-
Total	187,819	-	176,495	-	141,692	-

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 Name	FY 2016 Revised Enacted		FY 2017 Annualized CR		FY 2018 President's Budget	
	$	FTE	$	FTE	$	FTE
Research, Development, and Innovation	41,478	-	66,028	-	54,201	-
Total	41,478	-	66,028	-	54,201	-

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 Name	FY 2016 Revised Enacted		FY 2017 Annualized CR		FY 2018 President's Budget	
	$	FTE	$	FTE	$	FTE
Research, Development, and Innovation	85,065	-	86,483	-	58,248	-
Total	85,065	-	86,483	-	58,248	-

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 cybersecurity 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 is reviewed using 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 identifies, funds, and 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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	60%	65%	80%	73%	80%	80%
Result:	89%	93%	60%	73%	N/A	N/A

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 Name	**FY 2016 Revised Enacted**		**FY 2017 Annualized CR**		**FY 2018 President's Budget**	
	$	FTE	$	FTE	$	FTE
Acquisition and Operations Analysis	8,043	-	8,043	-	8,043	-
Research, Development, and Innovation	102,488	-	82,396	-	70,841	-
Mission Support	-	-	-	-	-	-
Total	110,531	-	90,439	-	78,884	-

Performance Measures

For Strengthen National Preparedness and Resilience, Management Measures are displayed to provide a more thorough context of expected performance results.

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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	21	21	21	21	18	18
Result:	11	22	17	18	N/A	N/A

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 Name	FY 2016 Revised Enacted		FY 2017 Annualized CR		FY 2018 President's Budget	
	$	FTE	$	FTE	$	FTE
Acquisition and Operations Analysis	39,060	-	37,809	-	34,509	-
Laboratory Facilities	133,731	136	133,943	136	92,243	121
Research, Development, and Innovation	18,000	-	21,549	-	18,000	-
University Programs	39,724	-	39,724	-	29,724	-
Mission Support	121,245	344	119,220	344	119,823	334
Total	351,760	480	352,245	480	294,299	455

Performance Measures

For *Mature and Strengthen Homeland Security*, two types of performance measures are presented. Strategic Measures represent S&T measures that gauge achievement for this mission area, and are considered to be our 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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	N/A	N/A	80%	80%	80%	80%
Result:	N/A	N/A	82%	100%	N/A	N/A

Management Measures

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 Capability Development Support (CDS) program milestones that are met, or completed, as established in the fiscal year budget execution plan. These milestones reflect the programmatic and technical events, accomplishments, or intermediate goals in the life of CDS projects and programs. These milestones indicate satisfactory progress toward achieving long-term program performance goals and Department-wide goals and objectives. In particular, this measure captures the contribution of CDS in supporting decisions resulting in improved acquisition and research and development outcomes across DHS. When CDS completes tests and evaluations, technical assessments, standards and operations analyses, and process analyses, the results of these analyses inform decisions for DHS Components, Acquisitions Review Board, Joint Requirements Council (JRC), R&D programs, standards community, and S&T that improve acquisition and R&D outcomes.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	75%	75%	75%	75%	75%	75%
Result:	100%	87%	100%	95%	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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
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. Complimentary 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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	75%	75%	75%	75%	75%	75%
Result:	62%	77%	62%	79%	N/A	N/A

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. 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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	75%	75%	75%	75%	75%	75%
Result:	95%	77%	80%	88%	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. 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 local, tribal, state, and Federal First Responders, including those on the front line of border protection and transportation security.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	75%	75%	75%	75%	75%	75%
Result:	77%	78%	85%	75%	N/A	N/A

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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	75%	75%	75%	75%	75%	75%
Result:	100%	86%	82%	92%	N/A	N/A

Science and Technology
Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Operations and Support	480	480	$302,079	480	480	$299,015	431	455	$254,618	(49)	(25)	($44,397)
Research and Development	-	-	$474,574	-	-	$472,675	-	-	$372,706	-	-	($99,969)
Total	**480**	**480**	**$776,653**	**480**	**480**	**$771,690**	**431**	**455**	**$627,324**	**(49)**	**(25)**	**($144,366)**
Subtotal Discretionary - Appropriation	480	480	$776,653	480	480	$771,690	431	455	$627,324	(49)	(25)	($144,366)

S&T requests 431 positions, 455 FTE, and $627.324M of total discretionary funding in FY 2018, a decrease of $144.366M from the FY 2017 annualized Continuing Resolution (CR).

S&T has prioritized Administration and Secretarial priorities within available resources based on the Department's Integrated Product Team (IPT) process, which prioritized capability gaps from around the Department that require research and development, and the internal S&T Portfolio and Analysis Review. The proposed strategic reductions will ensure that S&T is rightsized for the future and allow S&T to focus on the highest priority needs of the Homeland Security Enterprise (HSE), such as border security and immigration technology. The total decreases by appropriation include:

- A decrease of $44.397M in Operations and Support. This includes reductions across the three PPAs in O&S and the closure of the three laboratory facilities listed below.
  - National Biodefense Analysis and Countermeasures Center in Fort Detrick, Frederick, Maryland.
  - Chemical Security Analysis Center in Aberdeen Proving Ground, Aberdeen Maryland.
  - National Urban Security Technology Laboratory in Manhattan, New York City, New York and Oakbrook Terrace, IL (near Chicago).
- A decrease of $99.969M in Research and Development. This includes reductions or eliminations of projects in the Research, Development and Innovation (RD&I) PPA as well as reducing the number of Centers of Excellence from ten to seven. To better align S&T's resources to Administration and Secretarial priorities, S&T will not request funding for the following projects:
  - Chemical research and development.
  - Cargo security research and development.

  - Radiological and nuclear resiliency research and development.
  - Cyber education, outreach, experimental test beds, and research data repositories.
  - Eliminates most program funding for the DHS Standards program. S&T will maintain one FTE to ensure that DHS complies with Standards requirements.
- No funds are requested for Procurement, Construction, and Improvements in FY 2018.

Science and Technology
Comparison of Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$786,938		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	($10,285)		
Revised Enacted/Request	**$776,653**	**$771,690**	**$627,324**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$189,071	$225,221	$125,906
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$965,724**	**$996,911**	**$753,230**
Collections – Reimbursable Resources	$47,988	$24,500	$24,500
Total Budget Resources	**$1,013,712**	**$1,021,411**	**$777,730**
Obligations (Actual/Projections/Estimates)	$768,682	$745,373	$590,795
Personnel: Positons and FTE			
Enacted/Request Positions	480	480	431
Enacted/Request FTE	480	480	455
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	482	480	431
FTE (Actual/Estimates/Projections)	473	480	455

The FY 2018 estimated obligation is $590.795M out of an estimated $753.230M of total budgetary resources. Total budget obligations for FY 2017 and FY 2018 are based on FY 2016 execution.

Science and Technology
Personal Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Operations and Support	480	480	$83,526	$173.54	480	480	$85,070	$177.07	431	455	$82,729	$180.61	(49)	(25)	($2,341)	$3.54
Total	**480**	**480**	**$83,526**	**$173.54**	**480**	**480**	**$85,070**	**$177.07**	**431**	**455**	**$82,729**	**$180.61**	**(49)**	**(25)**	**($2,341)**	**$3.54**
Discretionary - Appropriation	480	480	$83,526	$173.54	480	480	$85,070	$177.07	431	455	$82,729	$180.61	(49)	(25)	($2,341)	$3.54

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

S&T's personnel compensation and benefits are accounted for in the Operations and Support Appropriation, Mission Support and Laboratory Facilities PPAs. The Mission Support PPA includes a salaries and benefits decrease of $0.4 million and Laboratory Facilities salaries and benefits decrease by $1.9 million. The total reduction in overall salaries and benefits is $2.3 million. The change in rate is driven by both a reduction in staffing and the FY 2018 pay increase and annualization. The FY 2018 request includes a reduction of 49 FTP (25 FTE) due to the closure of three laboratory facilities and R&D reductions. S&T expects to begin FY 2018 fully staffed, while utilizing various human capital tools to implement the staff reduction, thus resulting in a higher rate change than if staff was reduced on the first day of fiscal year.

Science and Technology
Pay by Object Class
Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$57,847	$59,324	$55,361	($3,963)
11.3 Other than Full-Time Permanent	$5,271	$5,274	$5,256	($18)
11.5 Other Personnel Compensation	$1,105	$975	$1,125	$150
12.1 Civilian Personnel Benefits	$19,078	$19,422	$20,437	$1,015
13.0 Benefits for Former Personnel	$225	$75	$550	$475
Total - Personnel Compensation and Benefits	**$83,526**	**$85,070**	**$82,729**	**($2,341)**
Positions and FTE				
Positions - Civilian	480	480	431	(49)
FTE - Civilian	480	480	455	(25)

Science and Technology
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Operations and Support	$218,553	$213,945	$171,889	($42,056)
Research and Development	$474,574	$472,675	$372,706	($99,969)
Total	**$693,127**	**$686,620**	**$544,595**	**($142,025)**
Discretionary - Appropriation	$693,127	$686,620	$544,595	($142,025)

The FY 2018 non-pay summary is $142.025 less than FY 2017 annualized Continuing Resolution (CR). This request includes decreases to Operations and Support and Research and Development programs associated with three laboratory closures and reduced R&D activities.

Science and Technology
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$3,387	$3,349	$2,782	($567)
22.0 Transportation of Things	$45	$46	$34	($12)
23.1 Rental Payments to GSA	$1,711	$1,827	$2,100	$273
23.2 Rental Payments to Others	$112	$112	$89	($23)
23.3 Communications, Utilities, and Misc. Charges	$81	$87	$60	($27)
25.1 Advisory and Assistance Services	$159,973	$158,837	$118,736	($40,101)
25.2 Other Services from Non-Federal Sources	$4,195	$4,183	$3,372	($811)
25.3 Other Goods and Services from Federal Sources	$316,081	$307,624	$249,858	($57,766)
25.4 Operation and Maintenance of Facilities	$5,758	$6,101	$4,291	($1,810)
25.5 Research and Development Contracts	$147,831	$147,849	$118,025	($29,824)
25.6 Medical Care	$3	$3	$3	-
25.7 Operation and Maintenance of Equipment	$4,739	$5,577	$5,346	($231)
26.0 Supplies and Materials	$4,097	$4,447	$3,299	($1,148)
31.0 Equipment	$7,677	$9,127	$8,394	($733)
32.0 Land and Structures	$612	$653	$450	($203)
41.0 Grants, Subsidies, and Contributions	$36,825	$36,798	$27,756	($9,042)
Total - Non Pay Object Classes	**$693,127**	**$686,620**	**$544,595**	**($142,025)**

Reductions in object classes is directly proportional with the decreases proposed in this FY 2018 President’s budget request.

Science and Technology
Supplemental Budget Justification Exhibits

Working Capital Fund

Dollars in Thousands

Appropriation and PPA	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget
Operations and Support	**$36,396**	**$26,755**	**$27,793**
Mission Support	$36,396	$26,755	$27,793
Total Working Capital Fund	**$36,396**	**$26,755**	**$27,793**

The DHS Working Capital Fund (WCF) provides 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 Mission Support PPA are used to acquire DHS WCF services, which include: IT services, human resources, and financial systems. The WCF also provides consolidated subscriptions, government-wide mandated services, and DHS crosscutting activities.

Science and Technology
Status of Congressionally Requested Studies, Reports and Evaluations

Fiscal Year	Due Date	Reference/Citation	Requirement	Status
FY 2016	1/17/2016	Senate Report 114-68, p. 131	**NBAF Construction Plan Update** S&T shall submit to the Committee a detailed update of NBAF construction progress and a schedule not later than 30 days after the date of enactment of this act.	Submitted
FY 2016	2/9/2016	Senate Report 114-68, p. 128	**Research and Development Results for FY 2015** In conjunction with the President's fiscal year 2017 budget request, S&T is to report on results of its R&D for the prior fiscal year to include all technologies, technology improvements, or capabilities delivered to frontline users.	Submitted
FY 2016	2/1/2016	Public Law 114-113 Joint Explanatory Statement, p. 15	**Component Obligation Plans – Q1** Obligation plans from each DHS component shall be provided to the Committees within 45 days of the date of enactment of this Act, with updates provided not later than 30 days after the end of each quarter.	Submitted
FY 2016	5/2/2016	Public Law 114-113 Joint Explanatory Statement, p. 15	**Component Obligation Plans – Q2** Obligation plans from each DHS component shall be provided to the Committees within 45 days of the date of enactment of this Act, with updates provided not later than 30 days after the end of each quarter.	Submitted
FY 2016	7/30/2016	Public Law 114-113 Joint Explanatory Statement, p. 15	**Component Obligation Plans – Q3** Obligation plans from each DHS component shall be provided to the Committees within 45 days of the date of enactment of this Act, with updates provided not later than 30 days after the end of each quarter.	Submitted
FY 2016	10/30/2016	Public Law 114-113 Joint Explanatory Statement, p. 15	**Component Obligation Plans – Q4** Obligation plans from each DHS component shall be provided to the Committees within 45 days of the date of enactment of this Act, with updates provided not later than 30 days after the end of each quarter.	Submitted

Science and Technology
Authorized/Unauthorized Appropriations

Dollars in Thousands

Budget Activity	Last year of Authorization	Authorized Level	Appropriation in Last Year of Authorization	FY 2018 President's Budget
	Fiscal Year	Amount	Amount	Amount
Operations and Support	N/A	N/A	N/A	$254,618
Mission Support	N/A	N/A	N/A	$119,823
Laboratory Facilities	N/A	N/A	N/A	$92,243
Acquisition and Operations Analysis	N/A	N/A	N/A	$42,552
Research and Development	N/A	N/A	N/A	$372,706
Research Development and Innovation	N/A	N/A	N/A	$342,982
University Programs	N/A	N/A	N/A	$29,724
Total Direct Authorization/Appropriation				$627,324

Science and Technology
Proposed Legislative Language

Operations and Support

For necessary expenses *of the Science and Technology Directorate* for *operations and 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**]***254,618,000*, of which $**[**89,043,000**]***134,795,000* **[**is for management and administration; and of which $189,690,000**]** shall remain available until September 30, **[**2019**]***2020: Provided*, That not to exceed $7,650 shall be for official reception and representation expenses.

Language Provision	Explanation
of the Science and Technology Directorate of the Science and Technology Directorate for *operations and support*, **[**science and technology research and development, acquisition, and laboratory operations**]**	Updated language for consistency.
$**[**278,733,000**]***254,618,000*	Dollar change only.
$**[**89,043,000**]***134,795,000*	Dollar change only.
[is for management and administration; and of which $189,690,000**]**	Removed unnecessary language for consistency.
[2019**]***2020*	Updated period of availability.

Research and Development

For necessary expenses *of the Science and Technology Directorate* 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**]***372,706,000*, to remain available until September 30, **[**2019**]***2020*.

Language Provision	Explanation
of the Science and Technology Directorate for **[**science and technology**]**	Updated language for consistency.
[including advanced research projects**]**	Removed unnecessary language for consistency.
*$***[**469,869,000**]***372,706,000*	Dollar change only.
[2019**]***2020*	Updated period of availability.

Science and Technology
Reimbursable Resources
Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Change		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Agriculture - Department of Agriculture	**Source**	-	-	$693	-	-	$700	-	-	$700	-	-	-
Operations and Support	Location	-	-	$693	-	-	$700	-	-	$700	-	-	-
Laboratory Facilities	Location	-	-	$693	-	-	$700	-	-	$700	-	-	-
Department of Agriculture - Agricultural Marketing Service	**Source**	-	-	$970	-	-	$1,000	-	-	$1,000	-	-	-
Operations and Support	Location	-	-	$970	-	-	$1,000	-	-	$1,000	-	-	-
Laboratory Facilities	Location	-	-	$970	-	-	$1,000	-	-	$1,000	-	-	-
Department of Defense - Department of Defense	**Source**	-	-	$3,798	-	-	$4,250	-	-	$4,250	-	-	-
Operations and Support	Location	-	-	-	-	-	$250	-	-	$250	-	-	-
Mission Support	Location	-	-	-	-	-	$250	-	-	$250	-	-	-
Research and Development	Location	-	-	$3,798	-	-	$4,000	-	-	$4,000	-	-	-
Research, Development and Innovation	Location	-	-	$3,338	-	-	$3,500	-	-	$3,500	-	-	-
University Programs	Location	-	-	$460	-	-	$500	-	-	$500	-	-	-
Department of Energy - Department of Energy	**Source**	-	-	$429	-	-	$500	-	-	$500	-	-	-
Research and Development	Location	-	-	$429	-	-	$500	-	-	$500	-	-	-
Research, Development and Innovation	Location	-	-	$429	-	-	$500	-	-	$500	-	-	-
Department of Homeland Security - Federal Emergency Management Agency	**Source**	-	-	$4,079	-	-	$1,300	-	-	$1,300	-	-	-
Operations and Support	Location	-	-	$167	-	-	$400	-	-	$400	-	-	-
Mission Support	Location	-	-	$2	-	-	$250	-	-	$250	-	-	-
Laboratory Facilities	Location	-	-	$165	-	-	$150	-	-	$150	-	-	-
Research and Development	Location	-	-	$3,912	-	-	$900	-	-	$900	-	-	-
Research, Development and Innovation	Location	-	-	$3,912	-	-	$900	-	-	$900	-	-	-
Department of Homeland Security - Transportation Security Administration	**Source**	-	-	$6,111	-	-	$1,950	-	-	$1,950	-	-	-
Operations and Support	Location	-	-	$796	-	-	$750	-	-	$750	-	-	-
Laboratory Facilities	Location	-	-	$506	-	-	$500	-	-	$500	-	-	-
Acquisition and Operations Analysis	Location	-	-	$290	-	-	$250	-	-	$250	-	-	-
Research and Development	Location	-	-	$5,315	-	-	$1,200	-	-	$1,200	-	-	-
Research, Development and Innovation	Location	-	-	$5,315	-	-	$1,200	-	-	$1,200	-	-	-
Department of Homeland Security - US Immigration and Customs Enforcement	**Source**	-	-	$1,848	-	-	$100	-	-	$100	-	-	-
Research and Development	Location	-	-	$1,848	-	-	$100	-	-	$100	-	-	-
Research, Development and Innovation	Location	-	-	$1,848	-	-	$100	-	-	$100	-	-	-
Department of Homeland Security - Citizenship and Immigration Services	**Source**	-	-	$265	-	-	$150	-	-	$150	-	-	-
Research and Development	Location	-	-	$265	-	-	$150	-	-	$150	-	-	-
Research, Development and Innovation	Location	-	-	$265	-	-	$150	-	-	$150	-	-	-
Independent Agency - Intelligence Community Management Account	**Source**	-	-	$3,295	-	-	$3,500	-	-	$3,500	-	-	-
Research and Development	Location	-	-	$3,295	-	-	$3,500	-	-	$3,500	-	-	-
Research, Development and Innovation	Location	-	-	$3,295	-	-	$3,500	-	-	$3,500	-	-	-

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Change		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Justice - Federal Bureau of Investigation	**Source**	-	-	$3,500	-	-	$3,500	-	-	$3,500	-	-	-
Research and Development	Location	-	-	$3,500	-	-	$3,500	-	-	$3,500	-	-	-
Research, Development and Innovation	Location	-	-	$3,500	-	-	$3,500	-	-	$3,500	-	-	-
Department of Defense - Research, Development, Test, and Evaluation	**Source**	-	-	$6	-	-	-	-	-	-	-	-	-
Research and Development	Location	-	-	$6	-	-	-	-	-	-	-	-	-
Research, Development and Innovation	Location	-	-	$6	-	-	-	-	-	-	-	-	-
Department of Justice - Drug Enforcement Administration	**Source**	-	-	$100	-	-	-	-	-	-	-	-	-
Research and Development	Location	-	-	$100	-	-	-	-	-	-	-	-	-
Research, Development and Innovation	Location	-	-	$100	-	-	-	-	-	-	-	-	-
Department of Homeland Security - United States Coast Guard	**Source**	-	-	$1,588	-	-	$1,500	-	-	$1,500	-	-	-
Research and Development	Location	-	-	$1,588	-	-	$1,500	-	-	$1,500	-	-	-
Research, Development and Innovation	Location	-	-	$1,588	-	-	$1,500	-	-	$1,500	-	-	-
Department of Homeland Security - National Protection and Programs Directorate	**Source**	-	-	$3,791	-	-	$900	-	-	$900	-	-	-
Research and Development	Location	-	-	$3,791	-	-	$900	-	-	$900	-	-	-
Research, Development and Innovation	Location	-	-	$3,791	-	-	$900	-	-	$900	-	-	-
Department of Homeland Security - US Customs and Border Protection	**Source**	-	-	$10,147	-	-	$2,600	-	-	$2,600	-	-	-
Operations and Support	Location	-	-	$441	-	-	$600	-	-	$600	-	-	-
Mission Support	Location	-	-	$342	-	-	$500	-	-	$500	-	-	-
Acquisition and Operations Analysis	Location	-	-	$99	-	-	$100	-	-	$100	-	-	-
Research and Development	Location	-	-	$9,706	-	-	$2,000	-	-	$2,000	-	-	-
Research, Development and Innovation	Location	-	-	$9,706	-	-	$2,000	-	-	$2,000	-	-	-
Department of Homeland Security - Office of the Under Secretary for Management	**Source**	-	-	$4,482	-	-	$1,000	-	-	$1,000	-	-	-
Research and Development	Location	-	-	$4,482	-	-	$1,000	-	-	$1,000	-	-	-
Research, Development and Innovation	Location	-	-	$4,482	-	-	$1,000	-	-	$1,000	-	-	-
Department of State - Department of State	**Source**	-	-	$150	-	-	$150	-	-	$150	-	-	-
Operations and Support	Location	-	-	$150	-	-	$150	-	-	$150	-	-	-
Laboratory Facilities	Location	-	-	$150	-	-	$150	-	-	$150	-	-	-
Department of Transportation - Department of Transportation	**Source**	-	-	$540	-	-	-	-	-	-	-	-	-
Research and Development	Location	-	-	$540	-	-	-	-	-	-	-	-	-
Research, Development and Innovation	Location	-	-	$540	-	-	-	-	-	-	-	-	-
Department of Homeland Security - Office of Health Affairs	**Source**	-	-	$204	-	-	$650	-	-	$650	-	-	-
Operations and Support	Location	-	-	$154	-	-	$150	-	-	$150	-	-	-
Acquisition and Operations Analysis	Location	-	-	$154	-	-	$150	-	-	$150	-	-	-
Research and Development	Location	-	-	$50	-	-	$500	-	-	$500	-	-	-
Research, Development and Innovation	Location	-	-	$50	-	-	$500	-	-	$500	-	-	-
Department of Homeland Security - Domestic Nuclear Detection Office	**Source**	-	-	$535	-	-	$350	-	-	$350	-	-	-
Operations and Support	Location	-	-	$10	-	-	-	-	-	-	-	-	-
Laboratory Facilities	Location	-	-	$10	-	-	-	-	-	-	-	-	-
Research and Development	Location	-	-	$525	-	-	$350	-	-	$350	-	-	-
Research, Development and Innovation	Location	-	-	$525	-	-	$350	-	-	$350	-	-	-
Intelligence Advanced Research Projects Activity	**Source**	-	-	$807	-	-	-	-	-	-	-	-	-
Research and Development	Location	-	-	$807	-	-	-	-	-	-	-	-	-
Research, Development and Innovation	Location	-	-	$807	-	-	-	-	-	-	-	-	-

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Change		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Canada	**Source**	-	-	$300	-	-	$400	-	-	$400	-	-	-
Research and Development	Location	-	-	$300	-	-	$400	-	-	$400	-	-	-
Research, Development and Innovation	Location	-	-	$300	-	-	$400	-	-	$400	-	-	-
Israel	**Source**	-	-	$350	-	-	-	-	-	-	-	-	-
Research and Development	Location	-	-	$350	-	-	-	-	-	-	-	-	-
Research, Development and Innovation	Location	-	-	$350	-	-	-	-	-	-	-	-	-
Total Collections		-	-	**$47,988**	-	-	**$24,500**	-	-	**$24,500**	-	-	-

Department of Homeland Security

Science and Technology

Operations and Support

Fiscal Year 2018

Congressional Justification

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Operations and Support

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Mission Support	344	344	$121,245	344	344	$119,220	324	334	$119,823	(20)	(10)	$603
Laboratory Facilities	136	136	$133,731	136	136	$133,943	107	121	$92,243	(29)	(15)	($41,700)
Acquisition and Operations Analysis	-	-	$47,103	-	-	$45,852	-	-	$42,552	-	-	($3,300)
Total	**480**	**480**	**$302,079**	**480**	**480**	**$299,015**	**431**	**455**	**$254,618**	**(49)**	**(25)**	**($44,397)**
Subtotal Discretionary - Appropriation	480	480	$302,079	480	480	$299,015	431	455	$254,618	(49)	(25)	($44,397)

Overview

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, facilities, mission support, headquarters, management and DHS Working Capital Fund (WCF) costs.

Budget Activities:

S&T has three program, project, and activities (PPAs) in the O&S appropriation. The three PPAs include Mission Support (MS), Laboratory Facilities, and Acquisition and Operations Analysis (AOA).

Mission Support

The MS PPA funds all of the corporate-level functions in S&T that allow the technical divisions to manage the Research, Development, Test, and Evaluation (RDT&E) programs. The MS PPA funds business operations, salaries and benefits and S&T's share of the 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 hea.dquarters functions including financial management, facility planning, maintenance, and other administrative functions. MS also funds the headquarters shared services agreements, and financial and programmatic databases. S&T plans to eliminate 20 FTP and 10 FTEs in Mission Support in FY 2018.

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 provide the knowledge and technology required to secure our homeland. The Laboratory Facilities PPA is being reduced by $41.700M for FY 2018. S&T plans to close three laboratory facilities and reduce staff by 33 positions, and plans to hire four positions for National Bio and Agro-Defense Facility (NBAF) operations. The total laboratory facilities staffing request is 121 FTE and 107 FTP for FY 2018; a reduction of 29 positions, and 15 FTE from the FY 2017 annualized Continuing Resolution (CR).

Acquisition and Operations Analysis
AOA 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. S&T plans to reduce AOA by $3.300M, including eliminating the Standards program, and the staff (three FTP) associated with this program retaining 1 FTE to remain as an S&T representative in the Standards community. The three FTP are paid out of the MS PPA and are included in the 20 FTP reduction.

Operations and Support
Budget Authority and Obligations
Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$312,364		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	($10,285)		
Revised Enacted/Request	**$302,079**	**$299,015**	**$254,618**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$60,353	$75,707	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$362,432**	**$374,722**	**$254,618**
Collections – Reimbursable Resources	$3,381	$4,000	$4,000
Total Budget Resources	**$365,813**	**$378,722**	**$258,618**
Obligations (Actual/Projections/Estimates)	$299,608	$290,086	$215,537
Personnel: Positons and FTE			
Enacted/Request Positions	480	480	431
Enacted/Request FTE	480	480	455
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	482	480	431
FTE (Actual/Estimates/Projections)	473	480	455

Operations and Support
Collections – Reimbursable Resources
Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Agriculture - Department of Agriculture	Source	-	-	$693	-	-	$700	-	-	$700
Department of Agriculture - Agricultural Marketing Service	Source	-	-	$970	-	-	$1,000	-	-	$1,000
Department of Defense - Department of Defense	Source	-	-	-	-	-	$250	-	-	$250
Department of Homeland Security - Federal Emergency Management Agency	Source	-	-	$167	-	-	$400	-	-	$400
Department of Homeland Security - Transportation Security Administration	Source	-	-	$796	-	-	$750	-	-	$750
Department of Homeland Security - US Customs and Border Protection	Source	-	-	$441	-	-	$600	-	-	$600
Department of State - Department of State	Source	-	-	$150	-	-	$150	-	-	$150
Department of Homeland Security - Office of Health Affairs	Source	-	-	$154	-	-	$150	-	-	$150
Department of Homeland Security - Domestic Nuclear Detection Office	Source	-	-	$10	-	-	-	-	-	-
Total Collections		**-**	**-**	**$3,381**	**-**	**-**	**$4,000**	**-**	**-**	**$4,000**

The FY 2018 estimated obligation is $215.537M out of an estimated $254.618M of total budgetary resources. Total budget obligations for FY 2017 and FY 2018 are based on FY 2016 execution data.

Operations and Support
Summary of Budget Changes
Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**480**	**480**	**$312,364**
FY16 Rescissions of prior year appropriations	-	-	($10,285)
Total Rescissions	**-**	**-**	**($10,285)**
FY 2016 Revised Enacted	**480**	**480**	**$302,079**
FY 2017 Annualized CR	**480**	**480**	**$299,015**
FY 2018 Base Budget	**480**	**480**	**$299,015**
Transfer to A&O from S&T/MS due to A&O WCF Activity Costs Removal	-	-	($14)
Transfer to OSEM/OGC from S&T/MS due to OGC WCF Activity Costs Removal	-	-	($3)
Transfer to USM/CHCO from S&T/MS due to CHCO WCF Activity Costs Removal	-	-	($55)
Transfer to USM/CIO from S&T/MS due to CIO WCF Activity Costs Removal	-	-	($1,308)
Transfer to USM/CPO from S&T/MS due to CPO WCF Activity Costs Removal	-	-	($151)
Transfer to USM/CRSO from S&T/MS due to CRSO WCF Activity Costs Removal	-	-	($248)
Transfer to USM/CSO from S&T/MS due to CSO WCF Activity Costs Removal	-	-	($18)
Total Transfers	**-**	**-**	**($1,797)**
FY17 Pay Raise	-	-	$1,158
FY17: FY16 Annualized Pay	-	-	$386
FY18 Pay Raise	-	-	$910
FY18: FY17 Annualized Pay	-	-	$303
Rent	-	-	$4,095
Total, Pricing Increases	**-**	**-**	**$6,852**
Hiring Freeze Savings	-	-	($2,600)
Total, Pricing Decreases	**-**	**-**	**($2,600)**
Total Adjustments-to-Base	**-**	**-**	**$2,455**
FY 2018 Current Services	**480**	**480**	**$301,470**
Acquisition and Operations Analysis	-	-	($3,300)
Laboratory Facilities Closures and Personnel Reductions	(29)	(15)	($41,700)
R&D and AOA Personnel Reductions	(20)	(10)	($1,852)

Budget Formulation Activity	Positions	FTE	Amount
Total, Program Decreases	**(49)**	**(25)**	**($46,852)**
FY 2018 Request	**431**	**455**	**$254,618**
FY 2017 TO FY 2018 Change	**(49)**	**(25)**	**($44,397)**

Budget Request Summary:

The S&T Directorate requests 455 FTE, 431 positions and $254.618M for O&S in FY 2018.

The adjustments-to-base total an increase of $0.603M and include:

- Transfer out of Mission Support Working Capital Fund to DHS HQ ($1.797M).
- Increase for FY 2018 federal pay raise and FY 2017 annualization, of pay $1.213M.
- Increase for FY 2017 federal pay raise and FY2016 annualization, of pay $1.544M.
- Increase rent $4.095M.
- Decrease for hiring freeze savings ($2.600M).

The program changes total a decrease of 49 FTE and $46.852 million and include:

- A program decrease of $3.300M in AOA.
- A program decrease of $41.700M and 29 positions (15 FTE) for Laboratory Facilities.
- A program decrease for 20 positions (10 FTE) in MS (reductions to staff correspond to decreased funding in AOA and R&D programs and projects).

Operations and Support
Justification of Pricing Changes

Dollars in Thousands

Pricing Changes	FY 2018 President's Budget		
	Positions	FTE	Amount
Pricing Change 1 - FY17 Pay Raise	-	-	**$1,158**
Mission Support	-	-	$724
Laboratory Facilities	-	-	$434
Pricing Change 2 - FY17: FY16 Annualized Pay	-	-	**$386**
Mission Support	-	-	$241
Laboratory Facilities	-	-	$145
Pricing Change 3 - FY18 Pay Raise	-	-	**$910**
Mission Support	-	-	$666
Laboratory Facilities	-	-	$244
Pricing Change 4 - FY18: FY17 Annualized Pay	-	-	**$303**
Mission Support	-	-	$222
Laboratory Facilities	-	-	$81
Pricing Change 5 - Hiring Freeze Savings	-	-	**($2,600)**
Mission Support	-	-	($1,696)
Laboratory Facilities	-	-	($904)
Pricing Change 6 - Rent	-	-	**$4,095**
Mission Support	-	-	$4,095
Total Pricing Changes	-	-	**$4,252**

2018 Pay Increase and Annualization of 2017 Pay: Increase of $1.213M to account for the 2.1 percent pay increase in FY 2017 and the 1.9 percent pay increase in FY 2018.

Hiring Freeze Savings: Decrease of $2.6M in salaries and benefits due to hiring freeze savings.

Rent: Increase of $4.095M increase due to the delayed move to St. Elizabeth's campus.

Operations and Support
Justification of Program Changes
Dollars in Thousands

Program Changes	FY 2018 President's Budget		
	Positions	FTE	Amount
Program Change 1 - Acquisition and Operations Analysis	**-**	**-**	**($3,300)**
Acquisition and Operations Analysis	-	-	($3,300)
Program Change 2 - Laboratory Facilities Closures and Personnel Reductions	**(29)**	**(15)**	**($41,700)**
Laboratory Facilities	(29)	(15)	($41,700)
Program Change 3 - R&D and AOA Personnel Reductions	**(20)**	**(10)**	**($1,852)**
Mission Support	(20)	(10)	($1,852)
Total Program Changes	**(49)**	**(25)**	**($46,852)**

Program Change
Acquisition and Operations Analysis

Description
The funding decrease in AOA is part of S&T's strategic reorganization to support border security and immigration priorities. The AOA reduction will eliminate funding for the Standards program and reduce funding for Technology Transition areas. The Standards program provides standard test methods, test kits and guidance to for DHS Components including TSA's Quality Assurance/Quality Control for standards for bulk, trace and stand-off explosive detection technologies, including non-aviation standards for other applications (i.e., facility security) and trace drug detection standards. In addition, the Standards program develops test methods for response robots capabilities that support aerial systems, submersibles, urban search and rescue, and bomb squads.

Justification
This decrement includes the elimination of the Standards Program by $3M and four FTE. S&T would retain one position fulfilling DHS coordination and oversight responsibilities and participating in standards committees. Standards development and enforcement relies on voluntary compliance and multi-agency and industry cooperation and will not impact current daily operations.

S&T plans to decrease funding to program transition by $.300M. Program transition establishes and implements technology development focusing on near-term S&T work on transitioning projects and capabilities needed by DHS Components, and their external customers.

Performance

This elimination of standards and reduction in program transition will have a minimal effect on work currently being performed. S&T will continue to work closely with the DHS components to ensure programs and systems reduce or mitigate the challenges in the safest, most efficient and most cost-effective manner.

Program Change

Laboratory Facilities

Description

The decrease in Laboratory Facilities will result in the closing of three labs, National Biodefense Analysis and Countermeasures Center (NBACC), Chemical Security Analysis Center (CSAC) and National Urban Security Technology Laboratory (NUSTL). S&T will eliminate 33 positions from the closing of the three laboratory facilities and increase the National Bio and Agro-Defense Facility (NBAF) by 4 positions, resulting in a net FTP decrease of 29 positions.

Justification

NBACC – S&T proposes to close the NBACC laboratory including the National Bioforensic Analysis Center (NBFAC) and the National Biological Threat Characterization Center (NBTCC) centers associated with $37.6 million and two FTP. NBACC aids in defending the nation against biological threats. Its work supports intelligence assessments, preparedness planning, emerging threat characterization and bioforensic analyses. The closing of NBACC laboratory also includes the National Bioforensic Analysis Center (NBFAC) and the National Biological Threat Characterization Center. The closing of the NBACC may impact DHS's ability to characterize select agents in research and during a Bio event; however, S&T assesses that capabilities at NBACC can be replicated at other facilities. The closing of NBFAC will have no impact on DHS components since its sole user is the Federal Bureau of Investigations (FBI).

S&T made the strategic decision to make corresponding reductions to the R&D Appropriation for Bioforensics R&D projects of $7.7M, including two centers located in NBACC National Bioforensic Analysis Center (NBFAC). NBFAC conducts technical analyses in support of federal law enforcement investigations, and the National Biological Threat Characterization Center conducts experiments and studies to better understand biological vulnerabilities and hazards. Together, these centers offer a national resource for understanding the risks posed by the malicious use of biological agents and the operational capability to support the investigation, prosecution and prevention of biocrimes and bioterrorism.

CSAC –S&T proposes to close the CSAC laboratory associated with $0.7 million and six FTP. CSAC identifies and assesses chemical threats and vulnerabilities in the United States and develops the best responses to potential chemical hazards. CSAC supports the homeland security community by providing a knowledge repository of chemical threat information, design and execution of laboratory and field tests, and a science-based threat and risk analysis capability, among other services. Elimination of CSAC may reduce DHSs ability to have direct scientific and research advice during a chemical incident; however, S&T assesses that capabilities at CSAC can be replicated at other facilities. Since S&T is closing CSAC, the strategic decision was made to reduce the corresponding projects in the R&D Appropriation. CSAC executes the Chemical Terrorism Risk Assessment (CTRA) to help the federal government manage its resources and priorities to the appropriate level of risk. Agencies use the CTRA Desktop Tool to maintain awareness of chemical threats and analyze mitigation and response strategies to protect the public. S&T proposes to eliminate its Chemical Program at $11 million, which would eliminate any R&D funding associated with CSAC.

NUSTL – S&T proposes to close the NUSTL laboratory associated with $3.4 million and 25 FTP. NUSTL serves as a federal resource supporting the successful development, evaluation and transition of homeland security technologies into field use for law enforcement, fire, and other emergency response agencies. First Responder operational test and evaluation (T&E) is not solely reliant on a dedicated facility in New York City, as these (T&E) activities can be carried out in field locations across the country. This program is run by the NUSTL staff, and elimination of this program reduces the need for S&T to operate and maintain NUSTL. S&T made the strategic decision to make corresponding reductions to the R&D Appropriation to eliminate the Radiological and Nuclear Resiliency Program in the amount of $5 million.

NBAF – S&T proposes an increase of four FTP in support of NBAF. NBAF will be a state-of-the-art, biocontainment laboratory for the study of diseases that threaten both America's animal agricultural industry and public health. NBAF will strengthen our nation's ability to conduct research, develop vaccines, diagnose emerging diseases, and train veterinarians. NBAF will initiate on-boarding of several positions in FY 2018 including the laboratory director, science director, and operations director.

Performance

With the closure of these three laboratory facilities, S&T will continue to provide 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. S&T will remain able to establish 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.

Program Change

Mission Support

Description

Program decrease of 20 positions, 10 FTE and a decrease of $1.9 million in Mission Support.

Justification

All salaries and benefits for the S&T directorate, with the exception of Laboratory Facilities, reside in the Mission Support PPA. Out of the 20 positions being decreased, 17 positions are associated with the program decreases in the R&D Appropriation, Research Development and Innovation PPA, and the remaining 3 positions will be reduced from the O&S Appropriation, AOA PPA. S&T is estimating a $1.852M cost savings from FY 2017 to FY 2018 with a reduction of 10 FTE.

Performance

S&T's mission is to deliver effective and innovative insight, methods and solutions for the critical needs of the HSE. The FTE reductions are directly associated with programs that are being eliminated or reduced and thereby will not affect S&T's performance. S&T's R&D work will continue to provide and support cutting-edge research to produce revolutionary changes in technologies, new capabilities and threat and risk assessments for the HSE.

Operations and Support
Personnel Compensation and Benefits
Pay Summary
Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Mission Support	344	344	$61,305	$177.7	344	344	$62,270	$180.8	324	334	$61,866	$184.33	(20)	(10)	($404)	$3.53
Laboratory Facilities	136	136	$22,221	$163.02	136	136	$22,800	$167.65	107	121	$20,863	$170.36	(29)	(15)	($1,937)	$2.71
Total	**480**	**480**	**$83,526**	**$173.54**	**480**	**480**	**$85,070**	**$177.07**	**431**	**455**	**$82,729**	**$180.61**	**(49)**	**(25)**	**($2,341)**	**$3.54**
Discretionary - Appropriation	480	480	$83,526	$173.54	480	480	$85,070	$177.07	431	455	$82,729	$180.61	(49)	(25)	($2,341)	$3.54

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

S&T will pursue a reduction in personnel of an estimated 49 FTP, 25 FTE through attrition, Voluntary Early Retirement Authority (VERA) and Voluntary Separation Incentive Payment (VSIP) authorities, or other reassignment possibilities within the Department. In addition, the Office of Chief Human Capital Officer may reassign individuals across the Department to support National Security priorities.

Mission Support: The increase of $0.888M is a result of a 1.9 percent pay increase for FY 2018. S&T is estimating a decrease of approximately $1M in cost savings in program management and administration cost savings as a result of the 10 FTE decrease. This amount assumes that funding will still be in place to cover FTEs until reassignment, retirement option and/or off boarding dates are determined for the positions that will be eliminated.

Laboratory Facilities: Estimated salaries and benefits will result in no change from FY 2017 to FY 2018. Maintaining the current salaries and benefits level will cover both the FY 2018 pay increase as well as continue to cover salaries and benefits until all designated employees complete their off boarding. FY 2018 is expected to begin fully staffed and will utilize various HR-related actions to complete staffing reductions.

Operations and Support
Pay by Object Class
Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$57,847	$59,324	$55,361	($3,963)
11.3 Other than Full-Time Permanent	$5,271	$5,274	$5,256	($18)
11.5 Other Personnel Compensation	$1,105	$975	$1,125	$150
12.1 Civilian Personnel Benefits	$19,078	$19,422	$20,437	$1,015
13.0 Benefits for Former Personnel	$225	$75	$550	$475
Total - Personnel Compensation and Benefits	**$83,526**	**$85,070**	**$82,729**	**($2,341)**
Positions and FTE				
Positions - Civilian	480	480	431	(49)
FTE - Civilian	480	480	455	(25)

The decrease of $2.341M is a result of decreased funding due to 49 FTP (25 FTE) reduction. The decrease of 49 positions is associated with the elimination of 29 positions in Laboratory Facilities PPA and 20 positions in Mission Support PPA

Operations and Support
Permanent Positions by Grade – Appropriation

Grades and Salary Range	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
Total, SES	16	17	17	-
GS-15	156	155	147	-8
GS-14	105	111	96	-15
GS-13	73	74	60	-14
GS-12	45	43	39	-4
GS-11	21	16	15	-1
GS-9	12	14	12	-2
GS-7	2	2	2	-
GS-6	1	1	-	-1
GS-5	4	4	3	-1
Other Graded Positions	45	43	40	-3
Total Permanent Positions	**480**	**480**	**431**	**-49**
Position Locations				
Headquarters	336	336	323	-13
U.S. Field	143	143	107	-36
Foreign Field	1	1	1	-
Averages				
Average Personnel Costs, ES Positions	181,818	182,572	184,260	1,688
Average Personnel Costs, GS Positions	121,532	124,169	124,713	544
Average Grade, GS Positions	14	14	14	-

The Mission Support PPA will result in a 20 FTP reduction. This includes a Program Management reduction of 17 FTP from the Research Development and Innovation PPA and 3 FTP reduction from the Acquisition and Operations Analysis PPA.

The Laboratory Facilities PPA will result in a 33 FTP reduction from CSAC, NBACC and NUSTL Laboratories. NBAF increases by 4 FTP for an overall decrease of 29 FTP.

Operations and Support
Non Pay Budget Exhibits
Non Pay Summary
Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Mission Support	$59,940	$56,950	$57,957	$1,007
Laboratory Facilities	$111,510	$111,143	$71,380	($39,763)
Acquisition and Operations Analysis	$47,103	$45,852	$42,552	($3,300)
Total	**$218,553**	**$213,945**	**$171,889**	**($42,056)**
Discretionary - Appropriation	$218,553	$213,945	$171,889	($42,056)

S&T is experiencing an overall decrease of $42.056M to the O&S appropriation. These non-pay reductions are directly proportional to the program related cuts in both AOA and Laboratory Facilities PPAs.

Operations and Support
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$1,739	$1,708	$1,487	($221)
22.0 Transportation of Things	$18	$20	$13	($7)
23.1 Rental Payments to GSA	$1,711	$1,827	$2,100	$273
23.3 Communications, Utilities, and Misc. Charges	$78	$84	$58	($26)
25.1 Advisory and Assistance Services	$92,591	$91,738	$65,694	($26,044)
25.2 Other Services from Non-Federal Sources	$1,354	$1,354	$1,131	($223)
25.3 Other Goods and Services from Federal Sources	$93,924	$86,430	$74,698	($11,732)
25.4 Operation and Maintenance of Facilities	$5,758	$6,101	$4,291	($1,810)
25.5 Research and Development Contracts	$6,523	$7,149	$6,653	($496)
25.6 Medical Care	$3	$3	$3	-
25.7 Operation and Maintenance of Equipment	$4,569	$5,408	$5,212	($196)
26.0 Supplies and Materials	$3,201	$3,555	$2,592	($963)
31.0 Equipment	$5,919	$7,377	$7,008	($369)
32.0 Land and Structures	$612	$653	$450	($203)
41.0 Grants, Subsidies, and Contributions	$553	$538	$499	($39)
Total - Non Pay Object Classes	**$218,553**	**$213,945**	**$171,889**	**($42,056)**

The reduction in O&S funds will result in reductions in all object class codes. These non-pay reductions are directly proportional to the program related decreases in both Acquisition and Operations Analysis and Laboratory Facilities.

Mission Support-PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Mission Support	344	344	$121,245	344	344	$119,220	324	334	$119,823	(20)	(10)	$603
Total	**344**	**344**	**$121,245**	**344**	**344**	**$119,220**	**324**	**334**	**$119,823**	**(20)**	**(10)**	**$603**
Subtotal Discretionary - Appropriation	344	344	$121,245	344	344	$119,220	324	334	$119,823	(20)	(10)	$603

PPA DESCRIPTION: Mission Support
S&T requests 324 positions and $119.823M for MS in FY 2018.

Program Description:

The 324 positions provide executive direction to S&T 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 research and development programs in the Research and Development Innovation, University Programs and Acquisition and Operations Analysis PPAs.

The Mission Support 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 salaries and benefits, 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

The Finance and Budget Division (FBD) provides 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 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 and managing S&T's procurements. The Financial Services Branch manages the conferences, travel and purchase card programs. The Financial Operations Branch is dedicated to sound fiscal stewardship of S&T'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 S&T. The Interagency Branch streamlines work with other agencies and supports the management and oversight of those agreements.

Administration and Support Division

The Administration and Support Division manages the facilities, personnel, and information technology (IT), and provides critical infrastructure support to S&T 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 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 S&T-sponsored FFRDCs.

Working Capital Fund

The DHS WCF provides 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 Mission Support 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.

Mission Support
Budget Authority and Obligations
Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$131,530		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	($10,285)		
Revised Enacted/Request	**$121,245**	**$119,220**	**$119,823**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$121,245**	**$119,220**	**$119,823**
Collections – Reimbursable Resources	$344	$1,000	$1,000
Total Budget Resources	**$121,589**	**$120,220**	**$120,823**
Obligations (Actual/Projections/Estimates)	$131,271	$118,984	$119,586
Personnel: Positons and FTE			
Enacted/Request Positions	344	344	324
Enacted/Request FTE	344	344	334
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	353	344	324
FTE (Actual/Estimates/Projections)	344	344	334

Mission Support
Collections – Reimbursable Resources
Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Defense - Department of Defense	Source	-	-	-	-	-	$250	-	-	$250
Department of Homeland Security - Federal Emergency Management Agency	Source	-	-	$2	-	-	$250	-	-	$250
Department of Homeland Security - US Customs and Border Protection	Source	-	-	$342	-	-	$500	-	-	$500
Total Collections		-	-	**$344**	-	-	**$1,000**	-	-	**$1,000**

The FY 2018 estimated obligation is $119.586M out of an estimated $120.823M of total budgetary resources. MS is an annual appropriation and S&T aims to obligate 99 percent of its funding in FY 2018 as it has executed in previous years. Total Budget Obligations for FY 2017 and FY 2018 are based on FY 2016 execution totals.

Mission Support
Summary of Budget Changes
Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**344**	**344**	**$131,530**
FY16 Rescissions of prior year appropriations	-	-	($10,285)
Total Rescissions	**-**	**-**	**($10,285)**
FY 2016 Revised Enacted	**344**	**344**	**$121,245**
FY 2017 Annualized CR	**344**	**344**	**$119,220**
FY 2018 Base Budget	**344**	**344**	**$119,220**
Transfer to A&O from S&T/MS due to A&O WCF Activity Costs Removal	-	-	($14)
Transfer to OSEM/OGC from S&T/MS due to OGC WCF Activity Costs Removal	-	-	($3)
Transfer to USM/CHCO from S&T/MS due to CHCO WCF Activity Costs Removal	-	-	($55)
Transfer to USM/CIO from S&T/MS due to CIO WCF Activity Costs Removal	-	-	($1,308)
Transfer to USM/CPO from S&T/MS due to CPO WCF Activity Costs Removal	-	-	($151)
Transfer to USM/CRSO from S&T/MS due to CRSO WCF Activity Costs Removal	-	-	($248)
Transfer to USM/CSO from S&T/MS due to CSO WCF Activity Costs Removal	-	-	($18)
Total Transfers	**-**	**-**	**($1,797)**
FY17 Pay Raise	-	-	$724
FY17: FY16 Annualized Pay	-	-	$241
FY18 Pay Raise	-	-	$666
FY18: FY17 Annualized Pay	-	-	$222
Rent	-	-	$4,095
Total, Pricing Increases	**-**	**-**	**$5,948**
Hiring Freeze Savings	-	-	($1,696)
Total, Pricing Decreases	**-**	**-**	**($1,696)**
Total Adjustments-to-Base	**-**	**-**	**$2,455**
FY 2018 Current Services	**344**	**344**	**$121,675**
R&D and AOA Personnel Reductions	(20)	(10)	($1,852)
Total, Program Decreases	**(20)**	**(10)**	**($1,852)**
FY 2018 Request	**324**	**334**	**$119,823**

Budget Formulation Activity	Positions	FTE	Amount
FY 2017 TO FY 2018 Change	**(20)**	**(10)**	**$603**

PPA Description

Mission Support: MS funds all of the corporate-level functions in S&T that allow the technical divisions to manage RDT&E programs. The MS PPA funds business operations, salaries and benefits and the S&T's share of the WCF. MS also funds the headquarters shared services agreements, and financial and programmatic databases.

Adjustments to Base Justification

The adjustments-to-base total an increase of $0.603M and includes:

- •Transfer out of Working Capital Fund services to DHS HQ offices $1.797M.
- •Increase for Federal pay raise and annualization of pay for both FY 2018 and FY 2017 of $1.853M.
- •Increase rent $4.095M.
- •Decrease for hiring freeze savings $1.696M.

Mission Support
Personnel Compensation and Benefits
Pay Summary
Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Mission Support	344	344	$61,305	$177.7	344	344	$62,270	$180.8	324	334	$61,866	$184.33	(20)	(10)	($404)	$3.53
Total	**344**	**344**	**$61,305**	**$177.7**	**344**	**344**	**$62,270**	**$180.8**	**324**	**334**	**$61,866**	**$184.33**	**(20)**	**(10)**	**($404)**	**$3.53**
Discretionary - Appropriation	344	344	$61,305	$177.7	344	344	$62,270	$180.8	324	334	$61,866	$184.33	(20)	(10)	($404)	$3.53

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

NARRATIVE EXPLANATION OF CHANGES

S&T will pursue a reduction in personnel of an estimated 20 FTP, 10 FTE associated directly with the R&D work, through attrition, Voluntary Early Retirement Authority (VERA) and Voluntary Separation Incentive Payment (VSIP) authorities, or other reassignment possibilities within the Department. In addition, the Office of Chief Human Capital Officer may reassign individuals across the Department to support National Security priorities.

FTE Change FY 2017-2018: Decrease in 20 positions and 10 FTE.

PCB Change FY 2017-2018: Decrease of $0.404M includes the FY 2018 pay increase for 344 FTE and is then reduced by an approximate cost savings for 10 FTE.

Average Cost Change FY 2017-2018: The average rate change takes into account the 1.9 percent increase at the FY 2017 FTE levels of 344 FTE and costs savings associated with a reduction of 10 FTE. The average rate change will increase by $.003 million.

Mission Support
Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$42,152	$42,920	$41,544	($1,376)
11.3 Other than Full-Time Permanent	$4,543	$4,614	$4,696	$82
11.5 Other Personnel Compensation	$621	$630	$780	$150
12.1 Civilian Personnel Benefits	$13,814	$14,031	$14,546	$515
13.0 Benefits for Former Personnel	$175	$75	$300	$225
Total - Personnel Compensation and Benefits	**$61,305**	**$62,270**	**$61,866**	**($404)**
Positions and FTE				
Positions - Civilian	344	344	324	(20)
FTE - Civilian	344	344	334	(10)

Pay Cost Drivers

Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Personnel S&B	344	$61,305	$178	344	$62,270	$181	324	$61,866	$184	(20)	($404)	$3
Total – Pay Cost Drivers	**344**	**$61,305**	**$178**	**344**	**$62,270**	**$181**	**324**	**$61,866**	**$184**	**(20)**	**($404)**	**$3**

S&T cost drivers for personnel salaries & benefits are due to human capital restructuring, reshaping, downsizing tools. It will take several months to implement reshaping tools. In addition, S&T may incur relocation costs in staff reassignments. All costs are directly proportional to the proposed staffing decreases.

Mission Support
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Mission Support	$59,940	$56,950	$57,957	$1,007
Total	**$59,940**	**$56,950**	**$57,957**	**$1,007**
Discretionary - Appropriation	$59,940	$56,950	$57,957	$1,007

The non-pay request for FY 2018 is $57.957M. The associated costs are primarily made up of operations and maintenance costs for facilities and equipment, contracts, funds sent to other federal agencies, supplies, training and travel.

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$572	$518	$528	$10
25.1 Advisory and Assistance Services	$11,435	$14,844	$14,234	($610)
25.2 Other Services from Non-Federal Sources	$305	$276	$282	$6
25.3 Other Goods and Services from Federal Sources	$39,359	$29,933	$31,406	$1,473
25.4 Operation and Maintenance of Facilities	$298	$270	$275	$5
25.5 Research and Development Contracts	$1,034	$1,753	$1,788	$35
25.6 Medical Care	$3	$3	$3	-
25.7 Operation and Maintenance of Equipment	$2,152	$3,024	$3,085	$61
26.0 Supplies and Materials	$282	$437	$445	$8
31.0 Equipment	$4,500	$5,892	$5,911	$19
Total - Non Pay Object Classes	**$59,940**	**$56,950**	**$57,957**	**$1,007**

Increase in the non-pay object class is associated with an increase in costs for rent in the FY 2018 request. Due to the delay in S&T's move to St. Elizabeth's in FY 2018, there is an additional funding requirement for WCF for rent in FY 2018.

Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Working Capital Fund (WCF)	$36,396	$26,755	$27,793	$1,038
Advisory and Assistance Services	$11,435	$14,844	$14,234	($610)
Equipment	$4,500	$5,892	$5,911	$19
Operations and Maintenance of Equipment	$2,152	$3,024	$3,085	$61
Research and Development Contracts	$1,034	$1,753	$1,788	$35
Other Costs	$4,423	$4,682	$5,146	$464
Total – Non Pay Cost Drivers	**$59,940**	**$56,950**	**$57,957**	**$1,007**

NARRATIVE EXPLANATION OF CHANGES

The primary costs driver associated with the Mission Support PPA is the WCF contributions, followed by CIO related costs in the form of contract, Interagency, equipment and operation and maintenance costs.

Laboratory Facilities-PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Laboratory Facilities	136	136	$133,731	136	136	$133,943	107	121	$92,243	(29)	(15)	($41,700)
Total	**136**	**136**	**$133,731**	**136**	**136**	**$133,943**	**107**	**121**	**$92,243**	**(29)**	**(15)**	**($41,700)**
Subtotal Discretionary - Appropriation	136	136	$133,731	136	136	$133,943	107	121	$92,243	(29)	(15)	($41,700)

PPA DESCRIPTION: Laboratory Facilities

S&T requests 121 FTE, 107 positions and $92.243M for Laboratory Facilities in FY 2018. The 107 position request includes the four new positions for NBAF operations. The new positions at NBAF will help to ensure that NBAF construction and operations remain on track for 2023.

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 provide the knowledge and technology required to secure our homeland.

Laboratory Operations: FY 2017: $133.942M. FY 2018 Request: $92.243M. 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 mission requirements while maintaining safe, secure, compliant, and efficient operations. S&T also maintains a partnership with 13 Department of Energy national laboratories that are vital to the national homeland security mission

In FY 2017, initiation of closure plans for Plum Island Animal Disease Center (PIADC) will begin to prepare for the transition to the NBAF in 2023. Further in FY 2018, S&T will close three laboratory facilities, National Urban Security Technology Laboratory (NUSTL), Chemical Security Analysis Center (CSAC) and National Biodefense Analysis and Countermeasures Center (NBACC) Operations.

National Bio and Agro-Defense Facility Operations

NBAF will be a state-of-the-art, biocontainment laboratory for the study of diseases that threaten both America's animal agricultural

industry and public health. The facility will strengthen our nation's ability to conduct research, develop vaccines, diagnose emerging diseases, and train veterinarians.

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 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 the foot and mouth disease vaccine and vaccine bank currently at PIADC.

The NBAF Federal management team and the MORS contract will begin in FY 2018 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.

NBAF will initiate on-boarding of federal staff in FY 2018 to include the laboratory director, science director, and operations director. Leased space will be required to house both federal and contractor staff as the facility is being constructed. Leased space will also be used to construct a mock-up of the NBAF laboratory spaces prior to final fit-out.

2017 Key Milestone Event

- Award OPTIC to support the Government in the development of planning documents for NBAF operational planning, including the MORS acquisition.
- Complete development of the CONOPS, which will serve as the guiding document for how the laboratory will be operated.
- Complete concrete pours for the laboratories' high containment walls.

2018 Key Milestone Event

- Complete hire of key federal operational staff to lead operational planning, including oversight of contract execution.

- Award MORS contract to begin executing activities to support achieving select agent registration in FY 2023.
- Begin erecting stainless steel frame and enclosing the main laboratory facility.

Plum Island Animal Disease Center Operations

Since 1954, Plum Island Animal Disease Center (PIADC) has served as the nation's premier defense against accidental or intentional introduction of transboundary animal diseases (a.k.a. foreign animal diseases) including foot-and-mouth disease (FMD). PIADC is the only laboratory in the nation that can work on live FMD virus (FMDV). PIADC provides a host of high-impact, indispensable preparedness and response capabilities, including vaccine R&D, diagnostics, training, and bioforensics among others.

PIADC has an interagency mission to protect U.S. agriculture from the threat of high-consequence foreign animal diseases. DHS is responsible for the operational management of PIADC. In addition, the DHS PIADC Targeted Advanced Development team –in partnership with USDA Agricultural Research Service and industry performs advanced development of vaccines of other biological countermeasures needed for and effective response to high threat foreign animal diseases such as FMD. The biologic countermeasure development at PIADC also supports S&T's agro-terrorism countermeasures program. Research at the facility occurs in biosafety level (BSL)-2, BSL-3, and BSL-4 Agricultural 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 operations costs include bio safety, security, operations and maintenance contract, Information Technology upgrades to support regulatory requirements, equipment replacement to endure safe facility operations, energy renewal projects and studies, utilities, and fuel.

2017 Key Milestone Event

- Complete construction of the liquid waste decontamination plant and move forward with an update to the security systems and IT system as required to support critical laboratory operations to the transition of the NBAF.
- Complete Conceptual Site Model will serve as a basis for determining Decontamination and Decommissioning projects.
- Conduct bio risk assessment of the current laboratory infrastructure and ensure repairs as necessary to ensure continued safe and secure operation of critical laboratory infrastructure until transition of the laboratory to the NBAF.
- Conduct test and evaluation of new FMDV master seed, which supports the development of biologic countermeasures for high threat foreign animal diseases.

2018 Key Milestone Event

- Develop validated decontamination procedures for biologic agents to support safe laboratory operations and the safe removal of equipment and other items from the laboratory, which support laboratory closure and transition to the NBAF.
- Support transition of the newly developed FMDV to manufacturing and safe storage of master seeds for availability in the potential outbreak of FMD.
- Complete the selection of a new contractor for the PIADC and move forward with the consolidation of almost 10 contracts for improved operational efficiency.
- Commence full operations of the liquid waste decontamination plant and complete remaining upgrade projects.

Transportation Security Laboratory (TSL) Operations

The Transportation Security Laboratory (TSL) is a federal laboratory aligned under S&T and which is responsible for researching, developing, testing and evaluating technologies to detect and mitigate the threat of explosives and other weapons that may be used against our nation's transportation systems and infrastructure. Since TSL's creation in 1992, the constantly evolving threats to our nation's transportation systems have spurred the need for rapid development of detection and mitigation technologies, which require testing by TSL prior to deployment. Major operational costs include rent, operation support contracts, building maintenance, utilities, energy renewal projects/studies, security, and information technology. TSL is located at the Federal Aviation Administration's William J. Hughes Technical Center in Atlantic City, NJ.

2017 Key Milestone Event

- Complete successful internal audits promoting management practices and development of standard operating procedures for ISO Certification and implementation of technical procedures by core labs.
- Demonstrate full operational capability of TSL's new laboratory building by conducting certification testing in each of the buildings two hardened test cells.
- Develop, test, and document the standard operating procedures for safely creating, analyzing, and testing marginally stable improvised explosives in quantities up to 100 grams.
- Implement a rigorous inventory management system for non-hazardous test materials and objects used to verify the performance of explosive detection devices, and implement a quality management program to obtain from system vendors and system users feedback regarding the quality and timeliness of TSL products.

2018 Key Milestone Event

- Establish a TSL-wide Risk Management Program that supports a more accurate assessment of the return on investment associated with TSL T&E activities.

- Develop and implement protocols for the validation of threat articles used to test, evaluate, and certify explosive detection devices.
- Publish an Automation Master Plan that will identify cost-effective facilities, equipment, and operating procedures to help reduce risk and increase quality of synthesized improvised explosive materials.
- Manage and operate TSL to complete IT upgrades and ensure all safety and security compliance is met.

Chemical Security Analysis Center 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 S&T's Chemical and Biological Division, DHS Components such as the National Protection and Programs Directorate (NPPD), the Office of Health Affairs (OHA), the United States Secret Service (USSS), the Transportation Security Administration and (TSA), and other Federal agencies. The CSAC provides science- and technology-based quality assurance information capabilities for acquiring, storing, indexing, evaluating and making strategically available cheminformatic data, technical reports and other threat and risk knowledge products across the chemical threat spectrum to support the unified effort to secure the Nation. Operational costs for this facility include rent, security, utilities, energy renewal projects/studies, and information technology. To better align with Administration and Secretarial priorities, S&T proposes to close CSAC in FY 2018. However, S&T believes the work conducted at this facility could be assumed by others in the field.

2017 Key Milestone Event

- Ensure that there are no Risk Assessment Code (RAC) 1-3 codes identified in the FY 2017 Q4 compliance report.
- Within 90 days of receiving the final annual Facility Assessment report, execute the mitigation and countermeasure actions identified in the report.
- Submit 100 percent inventory report to S&T Administrative Support Division (ASD) confirming accountability of all assigned government property.

National Urban Security Technology Laboratory Operations

NUSTL is a federal laboratory which provides testing and evaluation services and products to the national first responder community. The Laboratory's mission is to test, evaluate and analyze homeland security capabilities while serving as a technical authority to first responder, state and local entities protecting our cities. NUSTL services and products help first responders prepare, protect and respond to homeland security threats. NUSTL uniquely provides independent technology evaluations and assessments for first responders, thereby enabling informed acquisition and deployment decisions, and helping to ensure that responders have the best technology available to use in homeland security missions. NUSTL is a preferred and trusted partner with first responder agencies across all levels of government. NUSTL works with end users in the lab and field to promote successful deployment of both commercial and emerging technologies. NUSTL's activities emphasize testing and evaluation alongside responders in operational

scenarios, assisting with fielding of technologies, sponsoring R&D, supporting the development of Concept of Operations documents and providing post-deployment advisory support. NUSTL is the only lab entirely focused on first responders and enabling their mission effectiveness. NUSTL is a Government-owned, Government-operated laboratory located in the borough of Manhattan, New York, NY. Major operational costs include rent, the infrastructure required to test First Responder equipment, information technology, energy renewal projects/studies, and security. To better align with Administration and Secretarial priorities, S&T proposes to close NUSTL in FY 2018. However, S&T believes the work conducted at this facility could be assumed by others in the field.

2017 Key Milestone Event

- Complete training and annual audits to ensure compliance with the Safety, Health, Environmental Management Systems (SHEMS) and Environmental Safety and Health (ESH) regulatory requirements. Compliance to these operating standards ensures the safety, health and compliance of the facility and personnel to continue support of the mission critical areas of NUSTL.
- Conduct Quality Assurance and Quality Control training, audits, and reviews for the DHS mission essential administrative and technical functions of the Laboratory through NUSTL, such as Quality Management System in accordance with ISO9001:2015, the international standard that specifies requirements for a quality management system, Records Management, and Inventory Management. These mission sustainable cornerstone practices enable the Laboratory to maintain the daily operations and promote efficiencies and best practices allowing them to provide improved deliverables to both internal and external stakeholders.
- Complete risk infrastructure assessment and analysis of alternatives (AoA) to meet mission requirements to provide cost savings and practices for safe, secure, and efficient space utilization in conjunction with DHS Management Directorate Real Property Standards.

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). NBACC closely collaborates with the FBI and other law enforcement and national security agencies.

S&T operates NBACC as a Federally Funded Research and Development Center (FFRDC). The FFRDC plans, manages, and executes the NBACC research programs, and operates the facility. NBACC has achieved all of the required certifications and registrations for its biosafety level (BSL) 2, 3, and 4 laboratories. Major operational costs include safety, security, addressing and maintaining regulatory compliance, information technology and IT upgrades, facility equipment upgrades and refresh, utility and

garrison support costs, and energy renewal projects/studies. To better align with Administration and Secretarial priorities, S&T proposes to close NBACC in FY 2018.

2017 Key Milestone Event

- Completion of a site visit of the animal care program by Association for the Assessment and Accreditation of Laboratory Animal Care (AAALAC) International.
- Receive renewal of accreditation (valid three years) from AAALAC International.
- Receive National Bioforensic Analysis Center (NBFAC) ISO 17025 Renewal Assessment and Accreditation, November 2016 (valid two years from January 2017). This accreditation provides the framework for a Quality Management System for a testing or calibration laboratory.
- Submit second project year (PY-02) annual planning documentation to Contracting Officer.
- Complete annual testing of facility systems supporting BSL-3 operations, and document the findings in a report.
- Complete at least three Risk Assessments in compliance with ISO 31000 standard.
- Submit a 100% inventory report to S&T's Administrative Support Division (ASD) confirming accountability of all assigned government property.
- Report upon completion and results of annual testing of facility systems supporting BSL-4 operations.
- Demonstrate successful community outreach with at least one hosted visit at NBACC, at least one regional community activity, or at least one interaction that supports the quarterly benchmarking or peer review of an NBACC operational process.
- Implement the insider threat program approved by NBACC leadership.

Laboratory Facilities-PPA
Budget Authority and Obligations
Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$133,731		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$133,731**	**$133,943**	**$92,243**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$46,245	$57,171	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$179,976**	**$191,114**	**$92,243**
Collections – Reimbursable Resources	$2,494	$2,500	$2,500
Total Budget Resources	**$182,470**	**$193,614**	**$94,743**
Obligations (Actual/Projections/Estimates)	$125,928	$125,827	$66,385
Personnel: Positons and FTE			
Enacted/Request Positions	136	136	107
Enacted/Request FTE	136	136	121
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	129	136	107
FTE (Actual/Estimates/Projections)	129	136	121

Laboratory Facilities-PPA
Collections – Reimbursable Resources

Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Agriculture - Department of Agriculture	Source	-	-	$693	-	-	$700	-	-	$700
Department of Agriculture - Agricultural Marketing Service	Source	-	-	$970	-	-	$1,000	-	-	$1,000
Department of Homeland Security - Federal Emergency Management Agency	Source	-	-	$165	-	-	$150	-	-	$150
Department of Homeland Security - Transportation Security Administration	Source	-	-	$506	-	-	$500	-	-	$500
Department of State - Department of State	Source	-	-	$150	-	-	$150	-	-	$150
Department of Homeland Security - Domestic Nuclear Detection Office	Source	-	-	$10	-	-	-	-	-	-
Total Collections		**-**	**-**	**$2,494**	**-**	**-**	**$2,500**	**-**	**-**	**$2,500**

The FY 2018 estimated obligation is $66.385M out of an estimated $94.743M of total budgetary resources. Total budget obligations for FY 2017 and FY 2018 are based on FY 2016 execution totals.

Laboratory Facilities
Summary of Budget Changes
Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**136**	**136**	**$133,731**
FY 2016 Revised Enacted	**136**	**136**	**$133,731**
FY 2017 Annualized CR	**136**	**136**	**$133,943**
FY 2018 Base Budget	**136**	**136**	**$133,943**
FY17 Pay Raise	-	-	$434
FY17: FY16 Annualized Pay	-	-	$145
FY18 Pay Raise	-	-	$244
FY18: FY17 Annualized Pay	-	-	$81
Total, Pricing Increases	**-**	**-**	**$904**
Hiring Freeze Savings	-	-	($904)
Total, Pricing Decreases	**-**	**-**	**($904)**
FY 2018 Current Services	**136**	**136**	**$133,943**
Laboratory Facilities Closures and Personnel Reductions	(29)	(15)	($41,700)
Total, Program Decreases	**(29)**	**(15)**	**($41,700)**
FY 2018 Request	**107**	**121**	**$92,243**
FY 2017 TO FY 2018 Change	**(29)**	**(15)**	**($41,700)**

PPA Description

Laboratory Facilities: 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.

Adjustments to Base Justification

The adjustments-to-base total a net increase of $0 and includes:

- Increase for Federal pay raise and annualization of pay $0.904M.
- Decrease for hiring freeze savings $0.904M.

Laboratory Facilities
Personnel Compensation and Benefits
Pay Summary
Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Laboratory Facilities	136	136	$22,221	$163.02	136	136	$22,800	$167.65	107	121	$20,863	$170.36	(29)	(15)	($1,937)	$2.71
Total	**136**	**136**	**$22,221**	**$163.02**	**136**	**136**	**$22,800**	**$167.65**	**107**	**121**	**$20,863**	**$170.36**	**(29)**	**(15)**	**($1,937)**	**$2.71**
Discretionary - Appropriation	136	136	$22,221	$163.02	136	136	$22,800	$167.65	107	121	$20,863	$170.36	(29)	(15)	($1,937)	$2.71

* The FTE Rate calculation does not include Object Class 11.8-Special Personal Services Payments or 13.0-Benefits for Former Personnel.

NARRATIVE EXPLANATION OF CHANGES

The estimated salaries and benefits in Laboratory facilities will decrease by $1.937M from FY 2017 to FY 2018. S&T will pursue a reduction in personnel of an estimated 29 FTP, 15 FTE during FY 2018 through attrition, Voluntary Early Retirement Authority (VERA) and Voluntary Separation Incentive Payment (VSIP) authorities, or other reassignment possibilities within S&T, or across the Department to support National Security priorities.

FTE Change FY 2017-2018: Decrease of 29 positions and 15 FTE.

PCB Change FY 2017-2018: Decrease of $1.937 million includes the FY 2018 pay increase for 136 FTE, and the cost savings associated with the reduction of 15 FTE.

Average Cost Change FY 2017-2018: The average rate change takes into account the 1.9 percent pay increase at the FY 2017 FTE levels of 136 FTE and costs savings associated with a reduction of 15 FTE. The average rate change will increase by $0.003 million.

Laboratory Facilities
Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$15,695	$16,404	$13,817	($2,587)
11.3 Other than Full-Time Permanent	$728	$660	$560	($100)
11.5 Other Personnel Compensation	$484	$345	$345	-
12.1 Civilian Personnel Benefits	$5,264	$5,391	$5,891	$500
13.0 Benefits for Former Personnel	$50	-	$250	$250
Total - Personnel Compensation and Benefits	**$22,221**	**$22,800**	**$20,863**	**($1,937)**
Positions and FTE				
Positions - Civilian	136	136	107	(29)
FTE - Civilian	136	136	121	(15)

Due to the decrease in positions there will be a decrease of $1.937M in Laboratory Facilities pay in FY 2018.

Pay Cost Drivers

Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Personnel S&B	136	$22,221	$163	136	$22,800	$168	121	$ 20,863	$170	(15)	($1,937)	$3
Total – Pay Cost Drivers	**136**	**$22,221**	**$163**	**136**	**$22,800**	**$168**	**121**	**$20,863**	**$170**	**15**	**($1,937)**	**$3**

The primary pay cost drivers for Laboratory Facilities are directly associated with personnel compensation costs. Laboratory Facilities is requesting a decrease of 29 FTP/15 FTE in FY 2018 with expected cost savings of $1.937M. Potential cost savings could possibly be offset by relocation fees, retirement incentives and other off boarding activities for employees.

Laboratory Facilities
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Laboratory Facilities	$111,510	$111,143	$71,380	($39,763)
Total	**$111,510**	**$111,143**	**$71,380**	**($39,763)**
Discretionary - Appropriation	$111,510	$111,143	$71,380	($39,763)

The non-pay request for FY 2018 is $71.380. The decrement of $39.763M is associated with activities being reduced in laboratory operations due to the closure of three facilities.

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$566	$605	$416	($189)
22.0 Transportation of Things	$18	$20	$13	($7)
23.1 Rental Payments to GSA	$1,711	$1,827	$2,100	$273
23.3 Communications, Utilities, and Misc. Charges	$78	$84	$58	($26)
25.1 Advisory and Assistance Services	$61,805	$58,057	$33,979	($24,078)
25.2 Other Services from Non-Federal Sources	$591	$632	$435	($197)
25.3 Other Goods and Services from Federal Sources	$35,751	$38,182	$26,295	($11,887)
25.4 Operation and Maintenance of Facilities	$5,460	$5,831	$4,016	($1,815)
25.5 Research and Development Contracts	$561	$599	$413	($186)
25.7 Operation and Maintenance of Equipment	$336	$358	$247	($111)
26.0 Supplies and Materials	$2,919	$3,118	$2,147	($971)
31.0 Equipment	$1,102	$1,177	$811	($366)
32.0 Land and Structures	$612	$653	$450	($203)
Total - Non Pay Object Classes	**$111,510**	**$111,143**	**$71,380**	**($39,763)**

Reduction in object class is directly proportional with the decrease in the FY 2018 request.

Laboratory Facilities
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Advisory and Assistance Services	$61,805	$58,057	$33,979	($24,078)
Other Goods and Services from Federal Sources	$35,751	$38,182	$26,295	($11,887)
Operations and Maintenance of Facilities	$5,460	$5,831	$4,016	($1,815)
Supplies and Materials	$2,919	$3,118	$2,147	($971)
Rental Payments to GSA	$1,711	$1,827	$2,100	$273
Other Costs	$3,864	$4,128	$2,843	($1,285)
Total – Non Pay Cost Drivers	**$111,510**	**$111,143**	**$71,380**	**($39,763)**

NARRATIVE EXPLANATION OF CHANGES

The non-pay request for FY 2018 is $71.380M. The associated costs are primarily made up of operations and maintenance costs for the lab facilities, contracts, agreements with federal sources, supplies, and rental costs.

Acquisitions and Operations Analysis-PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Acquisition and Operations Analysis	-	-	$47,103	-	-	$45,852	-	-	$42,552	-	-	($3,300)
Total	**-**	**-**	**$47,103**	**-**	**-**	**$45,852**	**-**	**-**	**$42,552**	**-**	**-**	**($3,300)**
Subtotal Discretionary - Appropriation	-	-	$47,103	-	-	$45,852	-	-	$42,552	-	-	($3,300)

PPA DESCRIPTION: Acquisition and Operations Analysis

The S&T Directorate requests $42.552M for Acquisition and Operations Analysis in FY 2018.

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 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 programs life; standards to support the homeland security mission; and administration of the Support Anti-Terrorism by Fostering Effective Technologies (SAFETY) Act program.

The six thrust areas of AOA are Operations and Requirements Analysis; SAFETY Act; Standards; Systems Engineering; Test and Evaluation and Technology Transition Support. The CDS Group manages four of the five thrusts, and one thrust is being proposed for elimination in FY 2018.

Capability Development Support

This program provides S&T and DHS with leadership and oversight of the following four Thrust Areas: Operations and Requirements Analysis, Standards, Systems engineering, and Test and Evaluation. 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.

Operations and Requirements Analysis Thrust - FY 2017: $7.873M. FY 2018 Request: $7.873M.

Under the Office of Operations and Requirements Analysis, reviews homeland security operations to identify ways to prioritize cross-Department capability gaps, and duplications as well as identify cost effective solutions for Component operations and process inefficiencies. This office improves operations efficiencies, reduces duplicative programs, and unifies DHS's efforts 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.

FY 2017 Key Milestone Events

- Perform capabilities analysis for the Domain and Situational Awareness and Securing and Law Enforcement Joint Requirements Council (JRC) Portfolios.
- Complete a threat classification prediction analysis for CBP Air Marine Operations Center (AMOC). The analysis developed and delivered an analysis tool to the AMOC operators that enable them to predict in real-time the threat-probability of aircraft approaching the southern border of the United States. This results in earlier identification of suspicious aircraft and faster response time for law enforcement to engage high-threat aircraft crossing the U.S. border.
- Complete a radar coverage analysis for CBP Air Marine Operations to assess the pending mission impact on AMOC surveillance capability following U.S. government sale of portions of the frequency spectrum that would decrease the number of available surveillance radars. The radar coverage analysis analyzed AMOC's probability of detecting aircraft (accounting for the projected reduction in available radars) at ranges between 60 and 100 nautical miles from the U.S. southern border. The analysis results enabled AMOC to provide CBP and DHS leadership a data-driven, analytically defensible description of the mission impact ensuing from the gaps in radar coverage that would result following the frequency sell-off.
- Completed a statistical analysis for the DHS Executive Secretariat to characterize Department responsiveness to time-critical Congressional correspondence. The results enabled the Secretariat to provide a data-driven understanding of overall responsiveness as well as pinpoint which parts of the response process required improvement. In addition, ORA developed and delivered an analysis tool that automated the calculation of DHS executive correspondence response statistics for Congress – the Secretariat can now generate statistical response reports in minutes versus hours.
- Value Focused Modeling analysis for CBP AMOC that accomplished a bottoms-up examination of AMOC operations. The analysis identified how each AMOC mission function and task contributed to mission execution, and hence the value of each function and task. This resulted in a baseline "Value Model" for AMOC operations. This Value Model" now informs AMOC leadership on where staff resources or capability enhancements should be invested to have the greatest impact on mission

FY 2018 Key Milestone Events

- Perform capabilities analysis for at least two JRC Portfolios to be determined closer to FY 2018 based on the presidential priorities.
- Deliver three gap analyses final reports to DHS IPTs, Components, or Joint Task Forces supporting their requests.

Federally Funded Research & Development Center, Program Management Office: Homeland Security Operations and Analysis Center & Homeland Security System Engineering Development Institute

The Federally Funded Research and Development Center Program Management Office (FFRDC PMO), on the behalf of the Under Secretary for Science & Technology, provides centralized oversight and support of two of the Department's FFRDCs. They are the Homeland Security Systems Engineering and Development Institute (HSSEDI) and the Homeland Security Operational Analysis Center (HSOAC). These FFRDCs are 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.

HSOAC supports the 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. HSOAC works to solve complex Homeland Security Enterprise 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.

HSSEDI provides specialized independent and objective technical and systems engineering expertise to department components, program managers and operating elements in addressing national homeland security system development and integration issues. HSSEDI works to enhance the Department capabilities through the recommendation of new technologies; development of prototypes and proof-of-concept demonstrations; review of systems design optimization and trade-space considerations; development of integrating architectures and frameworks; application of enterprise systems engineering principles for improved interoperability and information sharing; establishment of technical standards, measures and best practices; and, development of realistic test environments and scenarios.

2017 Key Milestone Event

- The FFRDC PMO issued an IDIQ Core Management Task Order(s) in support of the IDIQ activities (i.e. Annual Report, Annual Core Research Report) and other PMO execution requirements for each FFRDC.
- The FFRDC PMO issued the necessary contracts to support and build out the HSSEDI SCIF

2018 Key Milestone Event

- The FFRDC PMO will issue an IDIQ Core Management Task Order(s) in support of the IDIQ activities (i.e. Annual Report, Annual Core Research Report) and other PMO execution requirements for each FFRDC.
- The FFRDC PMO will issue the necessary contracts to maintain the HSSEDI SCIF.

Joint Requirements Support

This effort leads capabilities and requirements analysis for the DHS JRC. A key element of the 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 significant cost savings. 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 chemical, biological, radiological, and nuclear (CBRN) surveillance and detection, 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.

Standards Thrust - FY 2017 Annualized Continuing Resolution: $3million. FY 2018 Request: $0.

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.

The Standards program provides standard test methods, test kits, and guidance to DHS Components including TSA's Quality Assurance/Quality Control for standards for bulk, trace, and stand-off explosive detection technologies; non-aviation standards for other applications (i.e., facility security. In addition, the Standards program develops test methods for response robots capabilities that support aerial systems, submersibles, urban search and rescue, and bomb squads.

The Standards program provides standard test methods, test kits and guidance to for DHS Components. With the elimination of Standards, homeland security enterprise and industrial base equities would not be represented in over 1000 new standards each year to deliver interoperable and counter-terrorism technologies to the Department, other Federal agencies, first responder community and private sector. S&T would retain one position to continue fulfilling DHS coordination and oversight responsibilities and participating in standards committees.

FY 2017 Key Milestone Events

- Provide standard test methods, test kits and guidance to at least one first responder organization for ground robot/unmanned system evaluation and exercise.
- Provide guidance and reference test material to at least one DHS Component (i.e. TSA) for Quality Assurance/Quality Control for standards for bulk, trace and stand-off explosive detection technologies, including non-aviation standards for other applications (i.e., facility security) and trace drug detection standards.
- Complete final annual standards report to National Institute of Standards Technology (NIST) per OMB A-119 for the National Technology Transfer and Advancement Act (NTTAA) for the previous Fiscal Year.
- Complete balloting documentary standards to support biothreat detection capabilities.

FY 2018 Key Milestone Events

- Compile and submit annual standards report to NIST per OMB A-119 for the NTTAA for the previous FY.

Systems Engineering Thrust - FY 2017: $4.364M. FY 2018 Request: $4.364M.

Under this program, the Office of Systems Engineering conducts Technical Assessments of S&T's R&D programs and assists DHS Acquisitions and R&D 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 system performance, risk, cost, and schedule. Current efforts include conducting Technical Assessments, which inform senior acquisition leaders of major technical risks prior to

making acquisition decisions; 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; leading the development and revision of the DHS Systems Engineering Life Cycle (SELC) policy, guidebook and supplemental guidance; 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.

FY 2017 Key Milestone Events

- Deliver at least four Letters of Technical Assessment, highlighting technical risks, analyzing technical challenges and assessing mitigation strategies to support upcoming Acquisition Review Boards (ARBs) and the Acquisition Decision Authority (ADA).
- Provide DHS with System Engineering recommendations for inclusion in at least three Acquisition Decision Memoranda for DHS.

FY 2018 Key Milestone Events

- Deliver at least four Letters of Technical Assessment that identify major technical risks and recommendations to reduce those risks to the DHS Acquisition Decision Authority to support acquisition decisions.
- Complete at least four systems engineering engagements with programs to assist them in planning and/or conducting systems engineering activities.

Test and Evaluation Thrust - FY 2017: $7.220M. FY 2018: $7.220M.

The Office of Test and Evaluation (T&E) provides support and assistance to the Department and all the Components in the following areas:

- Acts as the principal advisor on T&E to the Office of the Secretary and the Component heads.
- Develops policy and procedures for the planning, execution, and assessment of T&E.
- Monitors and reviews T&E and providing guidance for those level 1 & 2 programs on the Major Acquisition List (MAOL).
- Assist in the development of the DHS T&E professional. This includes develop and or update T&E curriculum, providing instructor support, and hosting T&E learning seminars and workshops.

Office of T&E works closely with all Level 1 & 2 programs on the MAOL in the area of T&E design; preparation, review and approval of the Test & Evaluation Master Plan (TEMP); review and approval of the Operational Test Agent; preparation, review and approval of the Operational Test Plan; and, participation in Program Working Integrated Product Teams.

Prior to Acquisition Decision Event 2C where a particular program begins production and delivery, the Office of T&E will develop a Letter of Assessment (LOA) for those Level 1 & 2 programs on the MAOL depicting the systems operational effectiveness, operational suitability, cybersecurity, and interoperability. The Office of T&E works to ensure that DHS integrates test and evaluation processes into the acquisition lifecycle framework (ALF), and SELC.

FY 2017 Key Milestone Events

- Deliver at least four Letters of Assessment to support upcoming ARBs and the ADA.
- Provide DHS with Test and Evaluation recommendations for inclusion in at least three Acquisition Decision Memoranda.

FY 2018 Key Milestone Events

- Deliver at least four Letters of Assessment to support upcoming ARBs and the ADA.
- Provide DHS with T&E recommendations for inclusion in at least three Acquisition Decision Memoranda for DHS.

Technology Transition Support Thrust – FY 2017: $15.352M. FY 2018: $15.052M.
This thrust facilitates the transition of S&Ts 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 (FSLTT) government partners to strengthen collaborative efforts, and to collect input on their technology gaps.

2017 Key Milestone Event

- Meet with the Homeland Security Science and Technology Advisory Committee four times a year, three in person meetings (quarterly) and one webinar. As a result IAO produced a report on the Internet of Things and defined threats and recommendations to mitigate IAO also produced a report on Best Practices for Social Media in Exercises to be distributed to

the First Responder Community. IAO has also produced 5 white papers on Cybersecurity, Artificial Intelligence, Autonomous Vehicles, Adaptive Manufacturing and Chemical, Biological, Radiological and Nuclear Detection. These 5 white papers will be included as appendices to the 2018 Quadrennial Homeland Security Review. The white papers included threat assessments, technological maturity and recommendations to support DHS's mission success in using or countering these technology areas.

- Update the Science Advisory Guide for Emergencies to ensure currency of membership and relevancy of incidents.
- Host three meetings of the Capabilities Development Working Group that focus on topics of mutual interest and collaboration opportunities between the DHS and DoD within the realm of science and technology, research and development, advanced concepts, testing, experimentation, and acquisition. Specific goals include reducing redundancy and facilitating technology transitions by: Exploring topics of mutual interest and decide on appropriate implementation paths; Supporting/informing policy, planning, decision-making activities; and developing an interagency technology scouting standard operating procedure to strengthen collaborative efforts to fill technology gaps.
- Develop an interagency technology scouting standard operating procedure to strengthen collaborative efforts to fill technology gaps.

2018 Key Milestone Event

- The Homeland Security Science and Technology Advisory Committee will meet four times a year, three in person meetings (quarterly) and one webinar. Deliverables are developed at the request of the Under Secretary for Science and Technology. Appropriate tasking includes topics that have direct policy implications, require extensive stakeholder coordination, understanding research and development trends, horizon scanning and scouting recommendation and in providing independent advice and recommendations that can be coordinated across the foremost experts in the R&D technology fields.
- Update the Science Advisory Guide for Emergencies (SAGE) to ensure currency of membership and relevancy of incidents. IAO will validate 95% accuracy of SME information and validate the SAGE programs capability annually.
- Hold three meetings of the Capabilities Development Working Group to share DHS's high priority technology gaps with the DOD joint staff leadership. The outcome will be to jointly develop solutions to close identified gaps while reducing redundancy and costs.
- Implement interagency technology scouting standard operating procedure to strengthen collaborative efforts to fill technology gaps.

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.

2017 Key Milestone Event

- Facilitate nine bilateral meetings for the Under Secretary and Deputy Under Secretary for S&T that develops partnerships with foreign governments and international organizations to enhance scientific and technical knowledge for the Homeland Security Enterprise (HSE).

2018 Key Milestone Event

- Facilitate nine bilateral meetings for the Under Secretary and Deputy Under Secretary for S&T that develops partnerships with foreign governments and international organizations to enhance scientific and technical knowledge for the Homeland Security Enterprise (HSE).

Knowledge Management and Technology Scouting

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.

SAFETY Act Thrust – FY 2017: $8.043M. FY 2018 Request: $8.043M.
This program provides liability protections for claims resulting 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 resilience. 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. In addition, the SAFETY Act Program actively supports DHS programs and initiatives (e.g., the National Infrastructure Protection Plan, TSA' Certified Cargo Screening Program, CBP's Customs-Trade Partnership Against Terrorism and other Federal anti-terrorism programs by developing a streamlined procedure for providing SAFETY Act coverage known as Block Designations.

2017 Key Milestone Event

- Complete draft process document to be used by program evaluators as procedures for determining the SAFETY Act liability insurance requirement.
- Identify critical infrastructure/key resilience (CI/KR) sectors that have under-represented SAFETY Act applicants.
- Develop outreach plan to SAFETY Act applicants who provide capabilities protecting under-represented critical infrastructure/key resilience (CI/KR) sectors.
- Hold at least two outreach events for SAFETY Act applicants who provide capabilities protecting under-represented critical infrastructure/key resilience sectors.

2018 Key Milestone Event

- Complete final version of process document to be used by program evaluators as procedures for determining the SAFETY Act liability insurance requirement.
- Develop plan to expand outreach to potential cybersecurity technology applicants.
- Develop process and procedures to conduct readiness assessments for potential SAFETY Act venue applicants prior to their full application submissions.

Office of the Chief Scientist
The Office of the Chief Scientist (OCS) serves as a senior advisor and analytic capability to the Under Secretary for Science and Technology. The office provides analysis of the overall S&T portfolio as well as assessments of individual technologies and investments. OCS will conduct a Portfolio Analysis and Review (PAR) to provide insight into the effectiveness of S&T's technology investment portfolio and oversee the reviews of programmatic health and capability development for each of S&T's individual programs and projects. These reviews will also provide a picture of how well S&T's programs are filling capability gaps identified and validated by the Integrated Product Team process and the First Responder Requirements Group. The office will also provide

analysis of emerging technologies which will often enable increased security while also posing new threats. Drones are a prime example of an emerging technology that can both increase DHS's ability to monitor vast stretches of unattended border as well as carry out a multitude of nefarious acts like delivering drugs over the border. These reviews and analytic activities will guide the Under Secretary and S&T's senior leadership in prioritizing and aligning S&T's investments to address the highest priorities of the Administration and Department and the most challenging missions faced by the operational elements of DHS.

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

Office of Public-Private Partnerships (P3)
P3 services and capabilities allow S&T to identify innovative technologies and companies, partner with innovators to develop technology solutions, and facilitate the transition of those solutions to homeland security end-users. These services and capabilities include technology scouting, market analysis, innovation experimentation, prize competitions, the EMERGE Accelerator Program, Long Range Broad Agency Announcement, managing execution of the Small Business Innovation Research (SBIR) program, and technology transfer and commercialization support services. P3 coordinates component-wide implementation of the S&T Innovation Strategy, which integrates S&T efforts to identify and leverage technology innovation for use by the homeland security enterprise. P3 facilitates S&T partnerships with innovative companies of all sizes, with a special focus on entrepreneurs, startups, and other non-traditional partners that have technologies and techniques that contribute to homeland security solutions. Collectively, P3 services and capabilities help to identify, develop, and deliver more effective and impactful solutions for the homeland security enterprise, through expanded partnerships with private sector innovators. P3 organizes its capabilities and services within the following three portfolios:

- Innovation Discovery: P3 provides capabilities for industry engagement and outreach, technology scouting, market analysis, horizon scanning, and innovation experimentation. These services ensure that S&T is actively engaging innovators and can identify and leverage current or emerging technologies, as well as examine commercial markets to inform R&D investment decisions relevant to a specific homeland security need or problem set.
- Partnering and Investment Mechanisms: P3 provides access to partnership and investment mechanisms that allow S&T to connect with a range of innovative performers, based on the varying needs and characteristics of a specific R&D program or project. These include prize competitions, the *EMERGE* Accelerator Program, Long-Range Broad Agency Announcement, and the Small Business Innovation Research program.
- Technology Transfer and Commercialization: P3's technology transfer services promote the transfer and exchange of knowledge, facilities or capabilities developed under Federal R&D funding with industry, State and local governments, academia and other Federal agencies through the execution of technology transfer agreements. P3 also provides

commercialization support through market analyses, commercialization strategies, business plans, and partnership development.

2017 Key Milestone Event

- 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.

2018 Key Milestone Event

- Provide technology scouting and market analysis to leverage emerging technology and an understanding of a market to inform the path forward for priority S&T R&D projects.
- Provide commercialization support services to priority S&T projects.

Acquisitions and Operations Analysis
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$47,103		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$47,103**	**$45,852**	**$42,552**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$14,108	$18,536	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$61,211**	**$64,388**	**$42,552**
Collections – Reimbursable Resources	$543	$500	$500
Total Budget Resources	**$61,754**	**$64,888**	**$43,052**
Obligations (Actual/Projections/Estimates)	$42,409	$45,275	$29,566
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Acquisitions and Operations Analysis
Collections – Reimbursable Resources

Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Homeland Security - Transportation Security Administration	Source	-	-	$290	-	-	$250	-	-	$250
Department of Homeland Security - US Customs and Border Protection	Source	-	-	$99	-	-	$100	-	-	$100
Department of Homeland Security - Office of Health Affairs	Source	-	-	$154	-	-	$150	-	-	$150
Total Collections		-	-	**$543**	-	-	**$500**	-	-	**$500**

The FY 2018 estimated obligation is $29.566M out of an estimated $43.052M of total budgetary resources. Budget Obligation estimates for FY 2017 and FY 2018 are based on FY 2016 obligation totals.

Acquisitions and Operations Analysis
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$47,103**
FY 2016 Revised Enacted	**-**	**-**	**$47,103**
FY 2017 Annualized CR	**-**	**-**	**$45,852**
FY 2018 Base Budget	**-**	**-**	**$45,852**
FY 2018 Current Services	**-**	**-**	**$45,852**
Acquisition and Operations Analysis	-	-	($3,300)
Total, Program Decreases	**-**	**-**	**($3,300)**
FY 2018 Request	**-**	**-**	**$42,552**
FY 2017 TO FY 2018 Change	**-**	**-**	**($3,300)**

PPA Description

Acquisitions and Operations Analysis: 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.

Adjustments to Base Justification

There are no ATBs for the AOA PPA.

Acquisitions and Operations Analysis
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Acquisition and Operations Analysis	$47,103	$45,852	$42,552	($3,300)
Total	**$47,103**	**$45,852**	**$42,552**	**($3,300)**
Discretionary - Appropriation	$47,103	$45,852	$42,552	($3,300)

The non-pay request for FY 2018 is $42.552M. The associated cost change from FY 2017 is primarily made up of Contracts and IAAs eliminated, due to the elimination of the Standards program.

Acquisitions and Operations Analysis
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$601	$585	$543	($42)
25.1 Advisory and Assistance Services	$19,351	$18,837	$17,481	($1,356)
25.2 Other Services from Non-Federal Sources	$458	$446	$414	($32)
25.3 Other Goods and Services from Federal Sources	$18,814	$18,315	$16,997	($1,318)
25.5 Research and Development Contracts	$4,928	$4,797	$4,452	($345)
25.7 Operation and Maintenance of Equipment	$2,081	$2,026	$1,880	($146)
31.0 Equipment	$317	$308	$286	($22)
41.0 Grants, Subsidies, and Contributions	$553	$538	$499	($39)
Total - Non Pay Object Classes	**$47,103**	**$45,852**	**$42,552**	**($3,300)**

Acquisitions and Operations Analysis
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Advisory and Assistance Services	$19,351	$18,837	$17,481	($1,356)
Other Goods and Services from Federal Sources	$18,814	$18,315	$16,997	($1,318)
Research and Development Contracts	$4,928	$4,797	$4,452	($345)
Operations and Maintenance of Equipment	$2,081	$2,026	$1,880	($146)
Travel	$601	$585	$543	($42)
Other Costs	$1,328	$1,292	$1,199	($93)
Total – Non Pay Cost Drivers	**$47,103**	**$45,852**	**$42,552**	**$3,300**

NARRATIVE EXPLANATION OF CHANGES

The non-pay request for FY 2018 is $42.552M. The associated costs are primarily made up of Contracts/IAAs, operations and maintenance and travel related costs.

Department of Homeland Security

Science and Technology

Research and Development

Fiscal Year 2018
Congressional Justification

Table of Contents

Research and Development

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Research, Development and Innovation	-	-	$434,850	-	-	$432,951	-	-	$342,982	-	-	($89,969)
University Programs	-	-	$39,724	-	-	$39,724	-	-	$29,724	-	-	($10,000)
Total	**-**	**-**	**$474,574**	**-**	**-**	**$472,675**	**-**	**-**	**$372,706**	**-**	**-**	**($99,969)**
Subtotal Discretionary - Appropriation	-	-	$474,574	-	-	$472,675	-	-	$372,706	-	-	($99,969)

Overview

Mission Statement for Science and Technology Directorate – Research and Development:

The mission of the Science and Technology Directorate (S&T) is to s*trengthen America's security and resiliency by providing knowledge products and innovative technology solutions for the Homeland Security Enterprise (HSE).* Congress created the S&T Directorate under the Homeland Security Act of 2002, among other things, to "[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, biological, radiological and nuclear 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 its mission, S&T has built a highly trained and technically-proficient staff that is DHS's core source of science, engineering, and analytical subject matter experts. Using its staff and budget for maximal impact, S&T has focused its 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 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.

Budget Activities:

The Directorate has two program, project, and activities (PPA) in the R&D appropriation. The two PPAs are Research, Development and Innovation (RD&I) and University Programs (UP).

Research, Development, and Innovation

RD&I provides state-of-the-art technology and/or solutions to meet the needs of DHS 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 Analysis; 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 COEs and Minority Serving Institutions.

Research and Development
Budget Authority and Obligations
Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$474,574		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$474,574**	**$472,675**	**$372,706**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$134,657	$149,514	$125,906
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$609,231**	**$622,189**	**$498,612**
Collections – Reimbursable Resources	$44,607	$20,500	$20,500
Total Budget Resources	**$653,838**	**$642,689**	**$519,112**
Obligations (Actual/Projections/Estimates)	$469,074	$455,287	$375,258
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

The FY 2018 estimated obligation is $375.257M out of an estimated $519.112M of total budgetary resources.

Research and Development
Summary of Budget Changes
Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$474,574**
FY 2016 Revised Enacted	**-**	**-**	**$474,574**
FY 2017 Annualized CR	**-**	**-**	**$472,675**
FY 2018 Base Budget	**-**	**-**	**$472,675**
FY 2018 Current Services	**-**	**-**	**$472,675**
Research, Development and Innovation	-	-	($89,969)
S&T - University Programs Centers of Excellence R&D	-	-	($10,000)
Total, Program Decreases	**-**	**-**	**($99,969)**
FY 2018 Request	**-**	**-**	**$372,706**
FY 2017 TO FY 2018 Change	**-**	**-**	**($99,969)**

Budget Request Summary:
The S&T Directorate requests $372.706M for R&D for FY 2018. This is a net decrease of $99.969M to basic, applied, and experimental R&D.

The program changes total a decrease of $99.969M and include:

- A program decrease of $89.969M in RD&I.
- A program decrease of $10.000M in UP.

Research and Development
Justification of Program Changes

Dollars in Thousands

Program Changes	FY 2018 President's Budget		
	Positions	FTE	Amount
Program Change 1 - Research, Development and Innovation	**-**	**-**	**($89,969)**
Research, Development and Innovation	-	-	($89,969)
Program Change 2 - S&T - University Programs Centers of Excellence R&D	**-**	**-**	**($10,000)**
University Programs	-	-	($10,000)
Total Program Changes	**-**	**-**	**($99,969)**

Program Change

Research, Development and Innovation

Description

The funding decrease in Research, Development and Innovation will be applied across the six thrusts: Apex, Cargo Security, Chemical, Biological and Explosive Defense Research and Development, Counter Terrorist, Cyber Security/Information Analysis, and First Responders/Disaster Resilience. In order to maximize available research and development funding, S&T leadership has prioritized projects to support Administration and Secretarial immigration and border security priorities.

Justification

- **Apex** – a decrement of $25.628M eliminates the Real-Time Bio-threat Awareness project and adjusts funding levels of Apex programs and Engines to focus on Administration and Secretarial priorities, including immigration and border security. The request maintains funding for the cross cutting Apex Engines and most Apex projects including Next Generation First Responder and Flood Awareness. The total funding for Apex programs is $53.3M.
- **Border Security** – a decrement of $8.348M eliminates funding under the Cargo and Point of Entry (POE) Security program: Air Cargo Screening, Cargo and Conveyance Security, Cargo Forensics, Land Sea Cargo Screening and other project reductions; to focus on Administration and Secretarial priorities, including immigration and border security. The request increases funding for administration priorities such as Land Border Security and Maritime Border Security. The total funding for Border Security programs is $48.4M.
- **Chemical, Biological and Explosive Defense Research and Development** – a decrement of $5.748M eliminates funding for Agriculture Screening and Surveillance, Chemical Detection and other project reductions to focus on Administration and

Secretarial priorities, including immigration and border security. The request increases funding for Bioagent detection while making strategic prioritizations in Explosive Detection. The total funding for Chemical, Biological and Explosive Defense Research and Development is $52.6M.

- **Counter Terrorist** – a decrement of $18.455M eliminates research funding for the Chemical Security Analysis Center, Multifunction Detectors and other project reductions to focus on Administration and Secretarial priorities, including immigration and border security. The request increases funding for Explosive Threat assessment by $7.1M. The total funding for Counter Terrorist is $81.1M.
- **Cyber Security/Information Analysis** – a decrement of $20.234M eliminates Cyber Security Research Infrastructure and Cyber Transition and Outreach investment to focus on Administration and Secretarial priorities, including immigration and border security. The request makes strategic adjustments to Information Analytics and Network & System Security and Investigations. The total funding for Cyber Security/Information Analysis is $48.2M.
- **First Responder/Disaster Resilience** – a decrement of $11.555M eliminates R&D projects: Bio-Forensics R&D; Bio-Forensics Operations (NBFAC); Chemical Forensics; Explosives, Radiological and Nuclear Attack Resiliency (Rad/Nuc); Interoperability and Compatibility Standards; and other adjustments to focus on Administration and Secretarial priorities, including immigration and border security. The request increases investment in Natural Disaster Resiliency projects. The total funding for First Responder/Disaster Resilience is $61.2M.

Performance

These strategic reductions will allow S&T to focus on the highest priority needs of the Homeland Security Enterprise (HSE). The request prioritizes Administration and Secretarial priorities within available resources based on the Department's Integrated Product Team (IPT) process, which prioritized capability gaps from around the Department that require research and development, and the internal S&T Portfolio and Analysis Review. With this proposal, S&T has sought to minimize the impact to DHS Component customers. S&T will continue to leverage R&D from other government agencies and the private sector to realize the highest return on investment in current and new technologies for the Homeland Security Enterprise.

Program Change
University Programs, COEs

Description
The $10.000M reduction in funding for the COEs will result in the elimination of three centers of excellence. The total funding for University Programs is $29.7M.

Justification
S&T plans to eliminate a current COE and two planned COEs as outlined below:

- **Maritime Security:** This current COE, led by Stevens Institute of Technology, enhances Maritime Domain Awareness (MDA) and develops strategies to support Marine Transportation System (MTS) resilience and educational programs for current and aspiring homeland security practitioners. This COE conducts research to support DHS and other federal agencies' arctic security missions.
- **Cross Border Threat Screening and Supply Chain Defense:** This proposed COE would have conducted R&D to support the identification of biological threats and/or hazards at ports of entry, land borders, and other critical nodes within the supply chain.
- **Counterterrorism:** This proposed COE would have examined adversarial behavior within the homeland and beyond our borders to better understand and anticipate evolving threats and the effectiveness of counterterrorism efforts.

Performance
The Office of University Programs (OUP) taps the expertise of the nation's colleges and universities to tackle tough homeland security challenges. Component access to the centers will remain available through basic ordering agreements maintained by S&T. OUP will continue to harnesses the intellectual power of America's universities for homeland security research, development and education to deliver tools, technologies, knowledge products, training and expertise to the Homeland Security Enterprise through the remaining COEs.

Research and Development
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Research, Development and Innovation	$434,850	$432,951	$342,982	($89,969)
University Programs	$39,724	$39,724	$29,724	($10,000)
Total	**$474,574**	**$472,675**	**$372,706**	**($99,969)**
Discretionary - Appropriation	$474,574	$472,675	$372,706	($99,969)

S&T's basic, applied, and experimental research and development funding is reduced by an overall decrease of $99.969M to the R&D appropriation. This reduction allows S&T to focus on Administration and Departmental priorities such as immigration and border security priorities. These non-pay reductions are associated with the program related cuts in both RD&I and UP.

Research and Development
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$1,648	$1,641	$1,295	($346)
22.0 Transportation of Things	$27	$26	$21	($5)
23.2 Rental Payments to Others	$112	$112	$89	($23)
23.3 Communications, Utilities, and Misc. Charges	$3	$3	$2	($1)
25.1 Advisory and Assistance Services	$67,382	$67,099	$53,042	($14,057)
25.2 Other Services from Non-Federal Sources	$2,841	$2,829	$2,241	($588)
25.3 Other Goods and Services from Federal Sources	$222,157	$221,194	$175,160	($46,034)
25.5 Research and Development Contracts	$141,308	$140,700	$111,372	($29,328)
25.7 Operation and Maintenance of Equipment	$170	$169	$134	($35)
26.0 Supplies and Materials	$896	$892	$707	($185)
31.0 Equipment	$1,758	$1,750	$1,386	($364)
41.0 Grants, Subsidies, and Contributions	$36,272	$36,260	$27,257	($9,003)
Total - Non Pay Object Classes	**$474,574**	**$472,675**	**$372,706**	**($99,969)**

The reduction in R&D funds will result in reductions in all object class codes. These non-pay reductions are directly proportional to the program related cuts in both RD&I and UP.

Research, Development, and Innovation – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Research, Development and Innovation	-	-	$434,850	-	-	$432,951	-	-	$342,982	-	-	($89,969)
Total	**-**	**-**	**$434,850**	**-**	**-**	**$432,951**	**-**	**-**	**$342,982**	**-**	**-**	**($89,969)**
Subtotal Discretionary - Appropriation	-	-	$434,850	-	-	$432,951	-	-	$342,982	-	-	($89,969)

PPA DESCRIPTION:

Research, Development and Innovation

The S&T Directorate requests $342.982M for RD&I in FY 2018.

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 Research, Development, Test and Evaluation (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 Analysis and First Responder/Disaster Resilience.

Research, Development, and Innovation – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$434,850		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$434,850**	**$432,951**	**$342,982**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$131,138	$142,424	$125,906
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$565,988**	**$575,375**	**$468,888**
Collections – Reimbursable Resources	$44,147	$20,000	$20,000
Total Budget Resources	**$610,135**	**$595,375**	**$488,888**
Obligations (Actual/Projections/Estimates)	$432,542	$415,737	$349,993
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

The FY 2018 estimated obligation is $349.993M out of an estimated $488.888M of total budgetary resources. .

Research, Development, and Innovation – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	-	-	**$434,850**
FY 2016 Revised Enacted	-	-	**$434,850**
FY 2017 Annualized CR	-	-	**$432,951**
FY 2018 Base Budget	-	-	**$432,951**
FY 2018 Current Services	-	-	**$432,951**
Research, Development and Innovation	-	-	($89,969)
Total, Program Decreases	-	-	**($89,969)**
FY 2018 Request	-	-	**$342,982**
FY 2017 TO FY 2018 Change	-	-	**($89,969)**

PPA Description

The funding decrease in RD&I will be applied across the six thrusts: Apex, Border Security, Chemical, Biological and Explosive Defense Research and Development, Counter Terrorist, Cyber Security/Information Analysis, and First Responders/Disaster Resilience. In order to maximize available research and development funding, S&T has prioritized R&D for DHS Components including border security, counterterrorism, explosives, cyber, and first responder/disaster resilience and minimizes reductions to biological defense investments.

Justification

S&T based its priorities on the Department's Integrated Product Team process, S&T's internal Portfolio Analysis and Review, and the Administration's immigration and border security priorities.

- **Apex** – Apex projects are crosscutting, multi-disciplinary projects agreed to by the requesting DHS Component and the Under Secretary for Science and Technology. Total funding for Apex projects is $53.3M. The decrement of $25.6 million eliminates the Real-Time Bio-threat Awareness project and adjusts funding levels of Apex programs.
- **Border Security** – 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. Total funding for Border Security is $484M, a decrement of $8.348M eliminates funding for Air Cargo Screening, Cargo and Conveyance Security, Cargo Forensics, Land Sea Cargo Screening and other R&D project reductions.

- **Chemical, Biological and Explosive Defense Research and Development** (CBE Defense) – S&T invests in R&D to support prevention and protective strategies and coordinated surveillance and detection to address CBE threats. R&D work includes: 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 by providing technology, methods, and procedures to detect CBE threats. Total funding for CBE Defense is $52.6M, a decrement of $5.748M, which eliminates funding for Agriculture Screening, and Surveillance, Chemical Detection and other R&D project reductions.
- **Counter Terrorist** – The S&T 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. Total funding for Counter Terrorist is $81.1M, a decrement of $18.455M, which eliminates research funding for the Chemical Security Analysis Center, Multifunction Detectors and other R&D project reductions.
- **Cyber Security/Information Analysis** – 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, law enforcement forensic capabilities, secure protocols, and software assurance. Total funding for Cyber Security/Information Analysis is $46.2M, a decrement of $20.234M, which eliminates Cyber Security Research Infrastructure and Cyber Transition and Outreach investments.
- **First Responder/Disaster Resilience** – 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. Total funding for First Responder/Disaster Resilience is $61.3M, a decrement of $11.555M, which eliminates Bio-Forensics R&D, Bio-Forensics Operations (NBFAC), Chemical Forensics, Explosives and Radiological/Nuclear Resiliency (Rad/Nuc), Interoperability and Compatibility Standards and other R&D project reductions

Adjustments to Base Justification

There are no adjustments to base in FY 2018.

Research, Development, and Innovation – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Research, Development and Innovation	$434,850	$432,951	$342,982	($89,969)
Total	**$434,850**	**$432,951**	**$342,982**	**($89,969)**
Discretionary - Appropriation	$434,850	$432,951	$342,982	($89,969)

The non-pay request for FY 2018 is $342.982M. The associated costs are primarily made up of contracts, funds sent to other federal agencies, supplies, training and travel. There is a decrease in management and support services that is proportional to the decrement in R&D activities. In addition, there is a proportional decrease in travel funding for federal employees supporting the R&D programs.

Research, Development, and Innovation – PPA
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$1,538	$1,531	$1,213	($318)
22.0 Transportation of Things	$27	$26	$21	($5)
23.2 Rental Payments to Others	$112	$112	$89	($23)
23.3 Communications, Utilities, and Misc. Charges	$3	$3	$2	($1)
25.1 Advisory and Assistance Services	$64,795	$64,512	$51,106	($13,406)
25.2 Other Services from Non-Federal Sources	$2,839	$2,827	$2,240	($587)
25.3 Other Goods and Services from Federal Sources	$220,595	$219,632	$173,991	($45,641)
25.5 Research and Development Contracts	$139,258	$138,650	$109,838	($28,812)
25.7 Operation and Maintenance of Equipment	$170	$169	$134	($35)
26.0 Supplies and Materials	$896	$892	$707	($185)
31.0 Equipment	$1,758	$1,750	$1,386	($364)
41.0 Grants, Subsidies, and Contributions	$2,859	$2,847	$2,255	($592)
Total - Non Pay Object Classes	**$434,850**	**$432,951**	**$342,982**	**($89,969)**

Reduction in all object class codes are proportional with the decreases to research and development projects in the FY 2018 request.

Research, Development, and Innovation – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Advisory and Assistance Services	$64,795	$64,512	$51,106	$(13,406)
Research and Development Contracts	$139,258	$138,650	$109,838	$(28,812)
Other Goods and Services from Federal Sources	$220,595	$219,632	$173,991	$(45,641)
Travel	$1,538	$1,531	$1,213	$(318)
Other Costs	$8,664	$8,626	$6,834	$(1,792)
Total Non Pay Cost Drivers	**$434,850**	**$432,951**	**$342,982**	**$(89,969)**

NARRATIVE EXPLANATION OF CHANGES

Advisory and Assistance Services: The decreases are proportional to the R&D projects reductions. Advisory and Assistance Services are contractual costs associated with administering R&D work.

Research and Development Contracts: The decreases are proportional to the R&D projects reductions and associated with the elimination of the Real Time Bio-Threat Awareness, Cargo Security, Chemical Detection, Cyber Infrastructure, Cyber Outreach, Bio-Forensics, and Explosive Rad/Nuc Resiliency projects. Research and Development Contracts are the direct cost of conducting research and development.

Other Goods and Services from Federal Sources: The decreases are proportional to the R&D projects reductions. Other Goods and Services from Federal Sources represents funding that is placed with other government agencies under the authority of the Economy Act.

Travel: The decreases in travel funding for federal employees supporting the R&D programs are proportional to the R&D projects reductions.

Other Costs: The decreases to the remainder of the costs are proportional to the R&D project reductions.

Research, Development, and Innovation – PPA
Research and Development
Technology Readiness Level Exhibit

PPA DESCRIPTION:

Research Development & Innovation PPA **–** Provides state-of-the-art technologies and solutions to meet the needs of the operational Components of the Department and the first responder community. 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 Analysis; and First Responder/Disaster Resilience.

Apex	$53.346M
Border Security	$48.401M
CBE Defense	$52.641M
Counter Terrorist	$81.051M
Cyber Security/Information Analytics	$46.248M
First Responder/Disaster Resilience	$61.294M
FY 2018 Request	$342.981M

1. **Apex** – FY 2017 Annualized Continuing Resolution: $78.973M. FY 2018 Request: $53.346M. Consists of crosscutting, multi-disciplinary projects agreed to by the requesting DHS Component Head and the Under Secretary for Science and Technology.

A. **Apex Programs** – FY 2017 Annualized Continuing Resolution: $60.974M. FY 2018 Request: $35.346M.

Apex Screening at Speed

- **Problem:** Continuously evolving threats at checkpoints necessitates an Apex Screening at Speed (SaS) program that provides technological innovation, while allowing for changing operational needs. The technology solutions for airports must improve the 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 causes sizable costs to the Government due to the number of lanes that must be staffed each day in order to securely screen the roughly 720 million passengers that board aircraft nationwide each year. Although the primary use will be for aviation screening, other screening venues also will be considered during development.

- **Solution:** The multi-year Apex SaS program researches and develops the new technology, techniques, and processes to the Transportation Security Administration's (TSA) highest security standards, so that aviation checkpoints can screen up to 300 passengers and their carry-on belongings per lane per hour. 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, while detecting more challenging emerging threats. Raising throughput and lowering costs will also enable highly secure screening to benefit other HSE customers including U.S. Customs and Border Protection (CBP) and the United States Secret Service (USSS). 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:** Apex SaS plans to invest in several capabilities: a future curb-to-gate screening architecture, advanced screening technologies, identity verification, risk-based methodologies, training and human performance, and surveillance and video analytics. These capabilities represent major steps toward relative to current checkpoints. One of the novel technologies is X-ray diffraction, which is an essential technology to explore for various TSA applications, including the checkpoint. Using today's technology, screening equipment cannot tell the difference between an ordinary bottle of water and a bottle of acetone. X-ray diffraction, by separating objects by their crystal structure, can differentiate between the two. Improved detection probabilities and reduced false alarms will translate into fewer secondary inspections, thereby lowering per-passenger costs for TSA, and reducing inconvenience for airline passengers. An integrated systems-of-systems approach focusing on open architectures will reduce security risks, reduce lifecycle costs, and facilitate rapid, cost-effective system upgrades as threats evolve.

Overall Project Funding

	FY2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	6,400	4,000	12,600	8,000
Obligations	-	5,894	2,820	236	-

FY 2016 Key Milestone 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.

FY 2017 Planned Key Milestone Events

- Hold Preliminary Design Review for Advanced Imaging Technology (AIT; "person scanner") prototype(s) that would scan walking (~1 m/s) passengers.
- Kick off a prize competition that challenges developers to find anomalies on people using higher-resolution data for an S&T funded prototype millimeter-wave Advanced Imaging Technology system.
- Deliver a prototype system to TSA that uses X-ray diffraction to screen personal and carry-on-sized items.
- Accept draft performance report for a prototype Widely Tunable Infrared Source quantum cascade laser system that illuminates and energizes substances for optical trace detection.
- Deliver system-specific final reports for all Qualification Readiness Assistance and Qualification Readiness Testing activities conducted on systems provided by OEMs such as: Active Millimeter Wave; X-ray Backscatter; Handheld Resolution Tools; Enhanced Metal Detectors; Advanced Technology X-Ray systems; Computed Tomography X-ray systems; alternative checkpoint technologies; Bottled Liquid Scanners and their alternatives.
- Deliver Final Report for a dual-energy computed tomography (CT), carry-on-sized bag scanner. Data will have been collected at the Transportation Security Laboratory using stream-of-commerce items and/or real threats.
- Hold a workshop with security stakeholders that will develop requirements for aviation security technologies.

FY 2018 Planned Key Milestone Events

- Analysis and primary design of a video passenger identity correlation system in an airport environment.
- Optimized phase contrast imaging prototype design for carry-on screening, including raw data of explosive and benign materials scanned using phase contrast methodologies.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Developed algorithms and prototype designs for automated systems that associate passengers with their accessible belongings.	FY 2016 Q4	FY 2018 Q3
Qualification Readiness Testing activities.	FY 2016 Q1	FY 2018 Q4
Developed algorithms that establish video passenger identity correlation in an airport environment.	FY 2016 Q4	FY 2018 Q3

FY 2017		
Report on phase contrast imaging system.	FY 2017 Q1	FY 2018 Q3
Assess phase contrast research prototype for applicability to TSA missions.	FY 2017 Q1	FY 2017 Q4
Refine design and performance of a Widely Tunable Infrared Source quantum cascade laser system.	FY 2017 Q1	FY 2017 Q2
Research components and configuration, and design an AIT, "person scanner") prototype.	FY 2017 Q1	FY 2017 Q4
FY 2018		
Delivery of phase contrast X-ray data on explosive and benign materials	FY 2018 Q2	FY 2018 Q4
Analysis and primary design of a video passenger identity correlation system in an airport environment	FY 2018 Q2	FY 2018 Q4

Type of Research

Developmental

Technical Readiness Level

DHS defines Technical Readiness levels by the following chart:

Basic Research		Applied Research		Technology Development	Technology Demonstration	System Development
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
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

The program plans to begin at TRL2 in FY 2016 and end at TRL7 in FY 2021.

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 Acquisition Program Management, 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**: 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 illegal border activity and aggregated analysis of trends, statistics and intelligence 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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	2,913	8,794	9,279	5,800
Obligations	-	2,600	6,334	2,150	-

FY 2016 Key Milestone Events (Prior Year)

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

FY 2017 Key Milestone Events (Year of Execution)

- Conduct pilot of Spiral 1 of the Border Situational Awareness project focused on establishing enterprise information sharing for CBP.
- Perform Spiral 2 requirements analysis and develop requirements focused on tactical response for CBP.

FY 2018 Key Milestone Events (Budget Year)

- Conclude pilot of Spiral 1; development of the Border Situational Awareness project focused on establishing enterprise information sharing for CBP.
- Initiate pilot of Spiral 2; focused on improving tactical response for CBP.
- Initiate Spiral 3; focused on improving strategic planning for CBP.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Conduct pilot of Spiral 1 of the Border Situational Awareness project focused on establishing enterprise information sharing for CBP	FY 2017 Q1	FY2017 Q2
Transition Spiral 1 enterprise information sharing capability into existing CBP system baseline	FY 2017 Q3	FY2018 Q1
Perform Spiral 2 requirements analysis and develop requirements focused on tactical response for CBP	FY 2017 Q1	FY2017 Q2
Perform integration and developmental testing of selected Spiral 2 solutions	FY 2017 Q3	FY 2018 Q2
FY 2018		
Conduct pilot of Spiral 2 of the Border Situational Awareness project	FY 2018 Q3	FY 2019 Q1

focused on improving tactical response for CBP		
Perform Requirements Analysis of Sprial 3 focusing on improving strategic planning	FY 2018 Q3	FY 2019 Q1

Type of Research

Developmental

Technical Readiness Level

The program began TRL 5 in FY 2017 or higher (multiple technologies being pursued) and end at TRL 7.

Transition Plans

Transition capabilities to CBP:

- Pilot integrated enterprise proof-of-concept capability at select 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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	13,090	10,039	10,000	4,000
Obligations	-	4,638	1,240	207	-

FY 2016 Key Milestone Events (Prior Year)

- 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

FY 2017 Key Milestone Events (Year of Execution)

- Complete Financial Sector Requirements Analysis.
- Complete Tech Forage list and make Go/No go decision for test & evaluation of technologies in two project areas.
- Conduct Testing and Evaluation of Forage Result.
- Transition prototype technologies, all analyses, models and knowledge products, to Financial Services Sector Institutions. Transition efforts will correspond to, and coincide with the two project / technology topic areas identified in the Tech Foraging phase each year.

FY 2018 Key Milestone Events (Budget Year)

- Revalidate Financial Sector Requirements and conduct test & evaluation of technologies in two additional project areas to address cyber gaps in sector
- Transition proven prototype technologies, all analyses, models and knowledge products, to Financial Services Sector Institutions

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Identify and engage FSS (Government and non-Government) stakeholders	FY 2016 Q1	FY 2016 Q1
Analyze FSS needs using National Institute of Standards and Technology (NIST) Cybersecurity Framework to develop a crosscutting assessment of asset classes to operational functions	FY 2016 Q2	FY 2016 Q2
Conduct Annual Financial Sector Exercise	FY 2016 Q2	FY 2016 Q4
FY 2017		
Partner with the Silicon Valley Innovation Program to issue the Financial Services Cyber Security Active Defense (FSCSAD) solitication to attract cutting-edge solutions from technology innovators	FY 2017 Q1	FY 2017 Q1
Conduct proof of concept, pilots and operational testing in the areas of Intrustion Deception, Moving Target Defense, and Isolation and Containment for the FSS.	FY 2017 Q2	FY 2017 Q4
Establish Other Transaction Authority agreement to rapidly test and transition technology solutions to the FSS	FY 2017 Q2	FY 2017 Q3
Conduct testing & evaluation of technologies that address Network Detection and Network Identification	FY 2017 Q3	FY 2017 Q4
FY 2018		
Transition analyses, models, technology prototypes, and knowledge products related to prior year testing & evaluation activities to FSS	FY 2018 Q1	FY 2018 Q2
Conduct testing & evaluation of technologies that address Application Identify and Data Protection for the FSS	FY 2018 Q1	FY 2018 Q4
Conduct market survey to determine evolving high priority threat areas for the FSS to inform additional technical areas to address.	FY 2018 Q2	FY 2018 Q2
Partner with the Silicon Valley Innovation Program (SVIP) to solicit the start up community to address high priority threat areas identified in market survey.	FY 2018 Q2	FY 2018 Q4

Type of Research
Developmental

Technical Readiness Level
The program will have varying TRL entry and exit points depending on the solution pursued for a specific Tech Foraging area. For less matured areas, the program plans to begin at TRL 3 and end at TRL 6. For more matured areas, the program plans to begin at TRL 6 and end at TRL 7

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.

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.

Overall Project Funding

	2014	2015	2016	2017	2018
Project Funding	-	-	7,000	6,000	0
Obligations	-	-	1,695	4,784	-

FY 2016 Key Milestone Events (Prior Year)

- Identify and validate Federal, State, local, and tribal 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.

FY 2017 Key Milestone Events (Year of Execution)

- 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.

FY 2018 Key Milestone Events (Budget Year)

This project will be terminated in FY 2018 to focus on higher priority R&D projects that align with Administration and DHS priorities.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Reports on an independent Capabilities Based Assessment for the NBIC	FY 2017 Q1	FY 2017 Q3
Conduct component interviews to develop detailed requirements and concept of operations for biodetection and biosurveillance	FY 2017 Q1	FY 2018 Q1
Apply systems engineering processes to develop national environmental biodetection architecture for DHS	FY 2017 Q2	FY 2018 Q3
Develop acquisition strategies to fulfill component and national biodetection and biosurveillance gaps and needs	FY 2017 Q2	FY 2018 Q3
Market survey and systems analysis of near-term biological detection technologies, to include next generation sequencing and mass spectrometry	FY 2016 Q4	FY 2017 Q4
Feasibility study of the utility of the Suite for Automated Global Electronic bioSurveillance (SAGES) during an emergency or disaster for DHS components and State and Local jurisdictions and recommendations for enhanced health surveillance	FY 2017 Q2	FY 2018 Q1
Demonstrate anomalous event alerting algorithms for use in disease outbreak investigation	FY 2017 Q1	FY 2018 Q1

Type of Research

Applied

Technical Readiness Level

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

Transition Plans

This project will be eliminated in FY 2018 to allow S&T to focus on Administration and DHS priorities. Useful knowledge products will be available to the Biosurveillance program and New York City biosurveillance/biodetection test-bed project.

Apex Next Generation First Responder Program

- 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 Next Generation First Responder (NGFR) program is developing a scalable and modular system 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.

Sub Project

- Communications Hub: Routes incoming and outgoing information to the chosen destination using the best available communication medium.
- Physiological Monitoring: Provides real-time feedback on the first responder and provides necessary insight to on-scene commanders and incident managers enabling them to make the best decisions possible in time critical situations.
- Assistant for Understanding Data through Reasoning, Extraction and synthesis (AUDREY): Performs as a human-like reasoning program for automated big data analytics.
- First Responder Electronic Jamming Exercise: Works towards identifying and combatting electronic jamming threats facing the first responder community.
- Project 25 Compliance Assessment Program (P25 CAP): Ensures that P25 communications equipment declared by the supplier is P25 compliant, and tested against the standards with publicly published results.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	6,628	4,542	4,546	4,546
Obligations	-	6,421	2,734	100	

FY 2016 Key Milestone Events (Prior Year)

- Conduct a First Responder Operational Exercise, evaluating the impact of global navigation satellite system (GNSS) challenged and electronic threat environments on first responder communications systems.
- Develop working draft of the NGFR Interface Control Document to raise industry awareness of the standards, data formats and interfaces NGFR devises are using.

FY 2017 Key Milestone Events (Year of Execution)

- Demonstrate NGFR technology, incorporating additional technologies and functionality of including the Wearable Communications Hub, advanced environmental and physiological monitoring, and enhanced data analytics.
- Conduct the 2017 First Responder Electronic Jamming Exercise to evaluate how technologies and tactics reduce the impact of electronic threats to first responder communications systems.

FY 2018 Key Milestone Events (Budget Year)

- Demonstrate NGFR Integration Spiral 3, incorporating additional technologies and functionality from the Spiral 2 and PlugFest events, including environmental and physiological monitoring augmented intelligence-enabled data synthesis, and personal protective equipment.
- Transition, commercialize, or make available through open source platforms at least three technologies (e.g., Analyses, models, technology prototypes and/or knowledge prototypes).

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Demonstrate the integration and interoperability of NGFR technology (e.g. Internet of Things Communications Hub and PPE) in Spiral 1.	FY 2016 Q3	FY 2016 Q3
Develop prototypes of the Wearable Communications Hub and plan integration into NGFR system architecture.	FY 2016 Q3	FY 2016 Q4
Conduct a proof of concept demo of the AUDREY system within the simulated test environment.	FY 2016 Q4	FY 2016 Q4
Demonstrate the Physiological Monitoring integrated capability in a live field test.	FY 2016 Q4	FY 2016 Q4
FY 2017		
Conduct DHS Component Communications Experiment in Boston, MA.	FY 2017 Q1	FY 2017 Q1
Complete technology foraging for 3D indoor mapping and visualization.	FY 2017 Q2	FY 2017 Q3
Update the communication hub software to transmit voice data over the network.	FY 2017 Q2	FY 2017 Q4
Demonstrate NGFR technology integration Spiral 2, incorporating additional technologies and functionality (communications hub, physiological monitoring, enhanced duty uniform, etc.) with first responders.	FY 2017 Q3	FY 2017 Q3
Conduct a PlugFest with industry vendors relevant to at least one portion of the NGFR system architecture (e.g., wearables).	FY 2017 Q4	FY 2017 Q4
FY 2018		
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.	FY 2018 Q2	FY 2018 Q2
Publish recommendations to better prepare public safety agencies to	FY 2018 Q3	FY 2018 Q3

Research & Development Description	Plan Start Date	Planned Completion
counter electronic threats, using the analysis from the 2017 First Responder Electronic Jamming Exercise.		
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.	FY 2018 Q4	FY 2018 Q4
Transition, commercialize, or make available through open source platforms at least three analyses, models, technology prototypes and knowledge products.	FY 2018 Q2	FY 2018 Q4

Type of Research

Developmental

Technical Readiness Level

The program begins at TRL2 and ends at TRL 6.

Transition Plans

- FRG has initiated a portfolio approach to integration of capabilities for the NGFR Apex 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 Apex spiral demonstrations. 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.

- The NGFR Apex program will collaborate with industry and identify key partners to test interoperability of commercially available sensors and communications equipment with the NGFR system in concert with NGFR Apex spiral demonstrations.

Apex Flood

- Problem: Flooding of all kind are a leading cause of fatalities and economic losses in the United States from natural disasters. Communities need new and emerging technologies that are designed to increase communities' resilience to flood disasters and provide flood predictive analytic tools to FEMA, state and local governments in effort to 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 consist 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, 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.

Sub Projects

- Reduce Fatalities: Develop and test an integrated flood warning system incorporating inexpensive, deployable flood sensors; information integration and modeling software; and an automated smartphone-based, geo-targeted alert system.
- Reduce Uninsured Losses: Assess technologies and practicality of developing a national inventory of structures database for flood-prone areas, especially identified FEMA Special Flood Hazard Areas; including type of structure, elevation and other relevant data.
- Improve Investment Decisions: Support more cost-effective investment decisions improving both residential property, business continuity and public/private infrastructure resilience by improving the decision-making tools available, including integrated

analytics such as Kentucky's Community Hazard Assessment and Mitigation Planning System (CHAMPS) tool, and the use of low cost historical satellite imagery to identify flood prone areas outside of those mapped to date by FEMA.

- Enhance Community Resilience: Promote faster and more complete recovery from flood disasters by identifying quantitative indicators of resilience that have practical use in guiding and mitigating investment decisions and by developing SOPs, planning methodologies and quantitative methods to integrate resilience analysis into local and state flood planning, response and mitigation activities.
- Improve Flood Data Quality and Access: Provide decision-makers with access to the data they need, when they need it, through developing a roadmap of the best available flood decision data for all data categories, developing new types of flood sensors that are cheap enough to be widely distributed and easily moved, developing technologies to create, maintain and share elevation and structure footprint data, and developing new technical methods for filling decision data gaps.
- Improve Predictive Models and Analytical Services: Provide decision-makers with access to better models for all phases of flood management. Review all available flood models and forecasting tools with multiple uses and users in mind; create flood alert models, tuned to local terrain, that can provide longer lead-times and more accurate geo-targeting; provide better coverage of inland and flash flooding, accounting for increased impervious surfaces and the availability of fine-grained elevation data from new technology and expand the coverage of models to better forecast the aftermath of floods.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	2,295	5,000	5,000	5,000
Obligations	-	2,114	4,167	0	-

FY 2016 Key Milestone Events (Prior Year)

- Demonstrate the technical capability to issue geo-target flood alerts.
- Initiate development of a Tsunami Module for the FEMA Hazards United States (HAZUS) program.

FY 2017 Key Milestone Events (Year of Execution)

- Complete Tsunami Module for FEMA HAZUS program.
- Develop technology and plan to scale geo-targeted flood alerts nationally.

FY 2018 Key Milestone Events (Budget Year)

- Determination on the feasibility of near real-time monitoring of dam/levee integrity by transmitting geo-targeted alerts from deployed dam/levee integrity/breach sensors. Includes creating and testing prototypes of the necessary low-cost, deployable,

networked dam/levee sensors.

- Deploy the first phase of a structure-level data utility service that provides insurers, flood plain managers and consumers with Digital Elevation Models (DEM) of structures whose geospatial footprints have been digitized through aerial imagery.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Complete development and initial testing of flood sensor prototypes.	FY 2016 Q3	FY 2016 Q3
Demonstrate the technical capaability to issue geo-targeted flood alerts.	FY 2016 Q1	FY 2016 Q3
Initiate development of the Tsunami Module for Hazus.	FY 2016 Q1	FY 2016 Q1
Complete initial pilots to test the accuracy of identificaiton of flood-prone areas through analysis of historical LANDSAT imagery.	FY 2016 Q4	FY 2016 Q4
FY 2017		
Put SUMMIT into production at FEMA as the first generation release of the NFDST.	FY 2017 Q3	FY 2017 Q3
Complete development of technologies required for the National Structures Inventory.	FY 2017 Q4	FY 2017 Q4
Complete the Tsunami Module for the FEMA HAZUS program.	FY 2017 Q4	FY 2017 Q4
Develop technology and plan to scale geo-targeted flood alerts nationally.	FY 2017 Q4	FY 2017 Q4
FY 2018		
Make a determination on the feasibility of near real-time monitoring of dam/levee integrity.	FY 2018 Q4	FY 2018 Q4
Deploy the first phase of a structure-level data utility service that provides insurers, flood plain managers and consumers with DEM.	FY 2017 Q3	FY 2018 Q4

Type of Research

Applied

Technical Readiness Level

This program begins at TRL2 and ends at TRL6.

Transition Plans

- Development of charter and 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: S&T is designing a robust, innovative and holistic .Gov cyber security architecture that mitigates modern threats by leveraging best practices and implementable solutions with minimal impact to workforce efficiency. S&T will also develop a robust data correlation and data analytics capability in partnership with the National Protection and Programs Directorate (NPPD) and other Federal Agencies.

- Impact: This effort will significantly improve the cyber security posture of the entire .Gov network and increase 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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	10,000	10,000	8,000
Obligations	-	-	8,789	0	-

FY 2016 Key Milestone Events (Prior Year)

- 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.

FY 2017 Key Milestone Events (Year of Execution)

- Evaluate the utility of classified signatures.
- Draft of the cyber security architecture including presentation and detailed schemas
- Draft of the Baseline requirements per components of the cyber architecture.

FY 2018 Key Milestone Events (Budget Year)

- Conduct demonstration of measurement infrastructure with at least one department or agency.
- Testbeds and pilot with at least one department or agency.
- Analysis and inclusion of new technologies to enhance the cyber security architecture based upon pilots.
- Red teaming results and implementation tests.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Executed Contract Awards	FY 2016 Q1	FY 2016 Q3
Draft Program Plan	FY 2016 Q2	FY 2016 Q3
FY 2017		
Implementation and integration of Software Defined Perimeter in testbed	FY 2017 Q2	FY 2017 Q3
Initial Architecture Report	FY 2017 Q1	FY 2017 Q3
FY 2018		
Development of in-house components as needed for the architecture	FY 2017 Q4	FY 2018 Q1
Initial pilot of available capabilities for the architecture	FY 2018 Q1	FY 2018 Q2

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. The program includes significant ongoing outreach and discussion with government agencies to ensure transition.

Apex Engines: FY 2017 Annualized Continuing Resolution: $18.000M. FY 2018 Request: $18.000M. The Apex Technology Engines have been designed to provide a concentration of expertise, people, and knowledge capabilities that support multiple Apex programs and components. The Engines work with Apex programs to anticipate program needs and deliver quality support and services for the Apex programs. The Engines efficiently source and deliver solutions. The Engines' collective experience and

awareness of emerging technology trends has resulted in a robust knowledge base and network that continually serves the dynamic needs of S&T, mission critical operators, and the DHS enterprise.

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 creates efficiencies for Apex programs that DHS operators and agents utilize by offering and implementing solutions addressing logical and physical access decisions across multiple domains. This work provides the operators and agents who use DHS 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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Budget	-	2,000	2,100	2,100	1,313
Obligations	-	1,579	1,927	0	-

FY 2018 Planned Key Milestone Events (Budget Year)

- Deliver a tool, technology or knowledge product that increases the security of the current CBP preclearance operations while improving the passenger experience.
- Deliver a tool, technology or knowledge product that improves the anti-spoofing capabilities of wearables and in-ground and above ground sensor platforms that support the mission requirements of emergency responders as well as border situational awareness and defense.

FY 2018 Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Enhancing Passenger PreClearance Project	FY 2017 Q3	FY 2019 Q3
Identity, Anti-Spoofing and Information Integrity of Wearables and Sensor Platforms Project	FY 2017 Q3	FY 2019 Q3

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- This project consists of a mixture of open source releases of technology and knowledge products, commercial capability development as well as direct transitions to Apex Programs and DHS Components.

Data Analytics Engine (DA-E)

- **Problem**: Leveraging data sources to compute threats, impacts, risks, decision support, and situational awareness continues to become increasingly challenging due to the exponential growth of data, particularly data associated with the Internet-of-Things. Further, data analytics technologies, including computational, methodological and systems components, rapidly evolve on six month innovation cycles making it difficult to track solution options.

- **Solution**: Keeping pace with growing data sets and rapidly evolving solutions 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 Homeland Security Enterprise. The DA-E assists in problem definition and solutions development for Department programs using relevant data sets, analytic methodology, technologies and systems in collaboration with subject matter experts from government, industry and academia. Further, DA-E works across disciplines to illuminate next generation problem sets and technologies (including social media and live streaming) to inform program planning, avoid technical obsolescence and prevent mission surprise.

- **Impact**: DA-E helps analysts, operators, and agents across DHS increase mission effectiveness by better leveraging data for decision-making. DA-E 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, and improve security and privacy protection across DHS analytics system investments.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Budget	-	4,461	4,250	5,300	5,211
Obligations	-	4,157	3,911	3,656	

FY 2018 Planned Key Milestone Events (Budget Year)

- Deliver reports on image, video, and speech analytic experiments to improve open source and social media analytics for DHS missions.
- Deliver a framework for approaching Real Time Analytics for Multi-Latency Multi-Party Metro Scale Networks (RAMMMNets) problem sets to improve the focus and impact of research efforts on homeland security mission priorities.
- Deliver an analysis of advanced analytic applications such as graph processing capabilities to Immigrations and Customs Enforcement (ICE) that demonstrate significant mission impact for national security investigations and that is also relevant to other DHS mission areas including nuclear threat detection and critical infrastructure protection.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Deliver report on image, video, and speech analytic experiments to improve open source and social media analytics for DHS missions.	FY 2018 Q1	FY 2018 Q2
Deliver a framework for approaching RAMMMNets problem sets for research.	FY 2018 Q1	FY 2018 Q2
Deliver an analysis of advanced analytic applications such as graph processing capabilities to ICE that demonstrate significant mission impact for national security investigations and that is also relevant to other DHS mission areas including nuclear threat detection and critical infrastructure protection.	FY 2018 Q3	FY2018 Q4

Type of Research

DA-E projects include elements of Basic, Applied, and Developmental research.

Technical Readiness Level

DA-E projects range from Technology Readiness Level 2 to 7.

Transition Plans

DA-E technology development efforts transition once they have been proven in the Component's operational environment. Social Media tools, the current major investment area, undergo an operational test pilot with end users. The pilots are supported by the respective DHS Component leadership who hosts S&T staff onsite to conduct the testing. The DHS Social Media Task Force, consisting of DHS-wide organizations, including the Office of the Chief Financial Officer, Office of Privacy, and Office of Civil Rights and Civil Liberties, oversees the pilots and addresses oversight issues before pilots begin to facilitate future transition.

Model & Simulation Engine (MS-E)

- **Problem**: Currently there is no centralized Modeling and Simulation (M&S) repository or single M&S coordination manager in DHS S&T. M&S is an analytical capability that is used across multiple S&T projects and programs, which have similar elements and requirements, and they are often discarded after the completion of the project -- there is an opportunity to coordinate M&S across these programs and to leverage capabilities and best practices from interagency partners such as the Department of Defense (DoD) Defense Modeling and Simulation Coordination Office (DMSCO).

- **Solution**: MS-E will provide a centralized repository and single-manager M&S Coordination function for mission-based models as well as modeling and simulation tools that will be available for use to S&T program managers. This will allow M&S analytical capabilities and best practices to be coordinated across programs.

- **Impact**: The M&S Engine will increase the efficiency of DHS component operators, eliminate duplication and save resources and money. The MS-E will enhance DHS S&T's collaboration with DoD and other agency partners in the M&S domain, and leverage best practices to ensure a coordinated M&S approach for S&T's Apex programs and other component programs. This coordinated approach assists mission critical Apex programs by providing M&S capabilities across the government to ensure the safety of our agents and citizens.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Budget	-	820	1,696	1,500	1,876
Obligations	-	1,005	833	190	-

FY 2018 Planned Key Milestone Events (Budget Year)

- Coordinate scenario development utilizing immersive simulation technologies through subject matter expertise, knowledge products, and best practices.
- Develop a DHS S&T Modeling and Simulation Coordination Strategy in collaboration with the DoD DMSCO; extending DMSCO's existing M&S Catalog and Enterprise Metacard Builder Resource (EMBR) to include DHS S&T M&S capabilities contributing to information sharing and delivering knowledge products.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Initiate the coordination of Next Generation First Responder (NGFR) scenario development utilizing immersive simulation technologies supporting NGFR training development through subject matter expertise, knowledge products, and best practices.	FY 2017 Q1	FY 2017 Q2
Develop a DHS S&T Modeling and Simulation Coordination Strategy in collaboration with the DoD DMSCO; extending DMSCO's existing M&S Catalog and Enterprise Metacard Builder Resource (EMBR) to include DHS S&T M&S capabilities contributing to information sharing and delivering knowledge products.	FY 2017 Q1	FY 2017 Q3
Establish an initial Counter Unmanned Aerial System (CUAS) Modeling and Simulation environment for DHS S&T and Component activities; contributes directly to DHS S&T Program Executive Office Unmanned Aerial Systems (PEO UAS) support to DHS Components and wider CUAS Community through delivering M&S subject matter expertise and tailored solutions.	FY 2017 Q1	FY 2017 Q4
FY 2018		
Establish Counter Small Unmanned Aerial Systems Advisory and Review Toolkit (C-SMART) 2.0 capabilities for the Program Executive Office for Unmanned Aerial Systems (PEO UAS). C-SMART 2.0 provides significant enhancements to 1.0 features, such as incorporating radio frequency (RF) propagation modeling to increase fidelity of UAS and C-UAS simulations.	FY 2017 Q4	FY 2018Q4
Expand NGFR immersive simulation technologies to include incident command (IC) training for fire, police, and unified command activities. This capability will allow joint tactics, techniques, and procedure (TTP) development, and enhancement of IC training delivered to HSE stakeholders.	FY 2017 Q2	FY 2018Q3

Research & Development Description	Plan Start Date	Planned Completion
Finalize co-development of DHS M&S Catalog in coordination with DMSCO using EMBR tools, and populate catalog with comprehensive list of DHS S&T M&S capabilities.	FY 2017 Q3	FY 2018Q3

Type of Research

Developmental and Applied

Technical Readiness Level

TRL 5 & 6

Transition Plans

FY 2017 –

- Initiate the coordination NGFR scenario development utilizing immersive simulation technologies supporting NGFR training development through subject matter expertise, knowledge products, and best practices. Transition Customer include: NGFR Apex, FLETC engaged in discussions, Orange County (FL) Fire and Rescue and Cambridge (MA) Fire Department.
- Develop a DHS S&T Modeling and Simulation Coordination Strategy in collaboration with the DoD Defense Modeling and Simulation Coordination Office (DMSCO); extending DMSCO's existing M&S Catalog and Enterprise Metacard Builder Resource (EMBR) to include DHS S&T M&S capabilities contributing to information sharing and delivering knowledge products. Transition Customers include: DHS S&T's Chemical and Biological Defense Division.
- Establish an initial Counter Unmanned Aerial System (CUAS) Modeling and Simulation environment for DHS S&T and Component activities; contributes directly to DHS S&T Program Executive Office Unmanned Aerial Systems (PEO UAS) support to DHS Components and wider CUAS Community through delivering M&S subject matter expertise and tailored solutions. Transition Customers include: PEO UAS and USSS

FY 2018 –

- Establish Counter Small Unmanned Aerial Systems Advisory and Review Toolkit (C-SMART) 2.0 capabilities for the Program Executive Office for Unmanned Aerial Systems (PEO UAS). C-SMART 2.0 provides significant enhancements to 1.0 features, such as incorporating radio frequency (RF) propagation modeling to increase fidelity of UAS and C-UAS simulations. Transition Customers include: PEO UAS, USSS, and CBP
- Expand NGFR immersive simulation technologies to include incident command (IC) training for fire, police, and unified command activities. This capability will allow joint tactics, techniques, and procedure (TTP) development, and enhancement

of IC training delivered to HSE stakeholders. Transition Customers include: NGFR Apex, FLETC, Orange County (FL) Fire and Rescue and Cambridge (MA) Fire Department.
- Finalize co-development of DHS M&S Catalog in coordination with DMSCO using EMBR tools, and populate catalog with comprehensive list of DHS S&T M&S capabilities. Transition Customers include: DHS S&T CBD, Apex Programs, and other M&S stakeholders

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 developed 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 has created a backbench capability for program managers to reach out to subject matter expertise in the social sciences. Additionally, the Engine assists Apex Project managers with specific tasks and deliverables of importance to the program which require social science techniques.

- **Impact**: BESS-E analyzes the social and behavioral implications of new technologies, programs, and polices to support their research, implementation, and diffusion across Apex programs, Federal, State, Local and Tribal agencies. Centralizing this capability in an Engine allows the BESS-E to impact multiple Apex programs and provide centralized support to DHS components, Federal, State, Local and Tribal agencies.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Budget	-	1,101	1,479	1,500	1,500
Obligations	-	989	582	0	-

FY 2018 Planned Key Milestone Events (Budget Year)

- Provide a knowledge product to FEMA with recommendations that can be used to decrease uninsured flood losses.
- Improve the transition of screening technologies to TSA by improving end-user perception and satisfaction.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Metrics Development	FY 2016 Q1	FY 2016 Q3
Requirements Gathering	FY 2016 Q1	FY 2016 Q4
FY 2017		
Evaluate Plugfest at Maritime Security Conference	FY 2017 Q1	FY 2017 Q2
Conduct interviews and focus groups with CBP agents to understand their intelligence needs	FY 2017 Q1	FY 2017 Q3
Develop a survey for homeowners in Virigina to better understand why they do or do not purchase flood insurance	FY 2017 Q2	FY 2017 Q3
FY 2018		
Conduct passenger intercept surveys at innovation task force lanes in airports	FY 2018 Q1	FY 2018 Q3
Develop a research plan to assess the effectiveness of emergency communications in making a listener take the recommended action	FY 2018 Q1	FY 2018 Q1

Type of Research

Applied.

Technical Readiness Level

N/A – BESS-E relies uponprimarily SME and knowledge product support.

Transition Plans

BESS-E serves as a research support function to the Apex Programs at DHS S&T. Our research is used to aid in the transition plans of those Apex Programs.

Communications & Networking (CN-E)

- **Problem**: During an emergency, public safety personnel frequently are unable to communicate with one another. Factors such as the non-interoperable radio equipment, insufficient radio bandwidth allocation, and outdated equipment all contribute to this problem. The Apex Communications and Network Engine (Apex CN-E) seeks to promote R&D in wireless communications solutions to deliver an interoperable and efficient communication ecosystem to vastly improve the first responder's communications capabilities.

- **Solution**: The CN-E Apex Engine is focusing its efforts to provide subject matter expertise, knowledge product and best practices in the following key areas: 1) promote standards-based communications solutions and leverage commercial available technologies to improve communication interoperability; 2) invest in systems that are designed to improve access to communication technologies in austere and degraded environments, such as noisy surroundings, as well as indoor and remote areas having limited or no wireless signals, 3) use of connected sensors (e.g., video, physiological and environmental) and wearable technologies to enable data analytics to further improve situational awareness during a mission.

- **Impact**: Apex CN-E will benefit DHS Apex Programs as they achieve greater level of communications interoperability between federal, state, local and tribal agencies. This will dramatically impact the Apex Programs' ability to communicate mission-critical information as they carry out their daily tasks of saving lives and protecting properties.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Budget	-	3,150	2,274	2,300	2,752
Obligations	-	2,900	2,600	0	-

FY 2018 Planned Key Milestone Events (Budget Year)

- Provision a portable band-14 LTE network system, allowing first responders to access the dedicated public safety spectrum, to participate in a public safety field exercise or an actual Component operational event and document the outcome as well as the technology's impact to the way information sharing is carried out by the end users.
- Document the technology demonstration outcome from the Phase 1 of the Speech Analytic project at a proof-of-concept event.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Milestone 1: The Next Generation First Responder Spiral 1 technology integration and demonstration event	FY 2015 Q4	FY 2016 Q2
Milestone 2: Technology demonstration for the Mobile Ad-hoc Network (MANET) communications system for the New York State Police and document the outcome.	FY 2016 Q2	FY 2016 Q4
FY 2017		
Milestone 3: Document the technology demonstration outcome from Next Generation First Responder Apex Program Spiral 2	FY 2017 Q1	FY 2017 Q4
Milestone 4: Technology demonstration for the Mobile Ad-hoc Network (MANET) communications system for the New York Police Department (NYPD) and document the outcome.	FY 2017 Q1	FY 2017 Q3
FY 2018		
Milestone 5: Provision a standalone band-14 LTE system to participate in a public safety field exercise or an actual Component operational event and document the outcome	FY 2018 Q2	FY 2018 Q2
Milestone 6: Document the technology demonstration outcome from the Phase 1 of the Speech Analytic project at a proof-of-concept event.	FY 2018 Q1	FY 2018 Q3

Type of Research

Basic, Applied and Developmental

Technical Readiness Level

Technology Readiness Level 3 to 6

Transition Plans

- Personal Area Network. Transition Plan: Communications Hub – FY 2018 Q2 to NGFR Apex.
- Incidental Area Network. Transition Plan: Deployable B14 LTE – FY 2017/18 to NGFR Apex. MANET – FY 2017 Q3 to BSA Apex.
- Broadband Communications Networks and Advanced Applications and Services. Transition Plan: Datacasting Network – FY 2016 plus several follow-on upgrades deployed with the City of Houston during FY 2017.
- Public Safety User Interface. Transition Plan: Speech Analytic Phase 1 – FY 2018 Q3 to NGFR Apex. Speech Analytic Phase 2 – FY 2019 Q3 to NGFR Apex.

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 in operational environments and meet Apex defined requirements.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Budget	-	3,468	2,751	2,300	1,939
Obligations	-	3,054	1,823	913	-

FY 2018 Planned Key Milestone Events (Budget Year)

- Develop prototype Flood Decision Support Tool.
- Assess IoT sensors, standards, and physical prototypes for interoperable situational awareness.
- Assess and test First Responder technology for protected and connected situational awareness tools (e.g. Wi-Fi finder, indoor mapping, and cyber security for IoT sensors).

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Architecture assessments, design documents and recommendations for Flood Apex, Border Situational Awareness Apex, and Real-Time BioThreat Apex	FY 2016 Q1	FY 2016 Q2/Q3
Interagency Working Group for Public Safety and Communications Identity and Credential Access Management (PSC-ICAM) use case definition, prioritize goals and associated task definition and preliminary assessments.	FY 2016 Q1	FY 2016 Q4
Request For Information (RFI) Prototype	FY 2016 Q2	FY 2017 Q1
FY 2017		
Develop draft Public Safety & Communications ICAM Procurement Guidance for First Responder community (e.g. SAFECOM and FirstNet) in support of the NGFR Apex.	FY 2017 Q2	FY 2017 Q4
Deploy Request For Information (RFI) Tool to operational environment within DHS Data Center for CBP field agents	FY 2017 Q3	FY 2017 Q4
Develop Smart City Interoperable Reference Architecture (SCIRA) with commercial industry partners and standards development organization leadership.	FY 2017 Q3	FY 2017 Q4
Assess Internet of Things (IoT) Intelligent Building Infrastructure sensors and building codes for 3-D imaging, imagery and motion detection.	FY 2017 Q3	FY 2018 Q1
Assess Unmanned Aerial Systems (UAS) as a delivery platform for IoT sensors for mass transit tunnel search & reconnaissance.	FY 2017 Q3	FY 2018 Q1
FY 2018		
Build out, test and recommend Trust Framework capability solution(s) for Public Safety & Communications stakeholders (SAFECOM and FirstNet) in support of NGFR Apex	FY 2018 Q1	FY 2018 Q4
Expand RFI Tool functionality for mobile, secure and disconnected communications for CBP field agents.	FY 2018 Q1	FY 2018 Q4
Test and evaluate Smart City Interoperable Reference Architecture (SCIRA) with selected stakeholder community for practical implementation and cyber security protocols	FY 2018 Q1	FY 2018 Q3
Prototype IoT Intelligent Building Infrastructure sensors with stakeholder community	FY 2018 Q1	FY 2018 Q4
Prototype UAS platform and sensor payload for mass transit tunnel search and reconnaissance.	FY 2018 Q1	FY 2018 Q4

Type of Research

Applied and Developmental.

Technical Readiness Level

Readiness Level 2 to 7.

Transition Plans

FY 2018-

- Build out, test and recommend Trust Framework capability solution(s) for Public Safety & Communications stakeholders (SAFECOM and FirstNet) in support of NGFR Apex. Transition: SAFECOM / FirstNet.
- Expand RFI Tool functionality for mobile, secure and disconnected communications for CBP field agents. Transition: CBP & OCIO.
- Test and evaluate Smart City Interoperable Reference Architecture (SCIRA) with selected stakeholder community for practical implementation and cyber security protocols. Transition: Open Geospatial Consortium (industry).
- Prototype IoT Intelligent Building Infrastructure sensors with stakeholder community. Transition: SBIR, GSA and Industry
- Prototype UAS platform and sensor payload for mass transit tunnel search and reconnaissance. Transition: SBIR, Boston Fire and Industry.

Partnership Mechanisms and Technology Transition (*formerly "TITAN")*

- **Problem:** To support the broad mission of DHS and keep pace with rapid changes in technology, S&T requires access to a wide range of innovative companies to include non-traditional Government partners. To encourage these innovative companies to engage with the Government requires creative approaches to communicate and invest with these non-traditional partners on specific problem sets.

- **Solution:** S&T provides a suite of capabilities to engage non-traditional partners (e.g., startups, incubators, accelerators) in the development of technology solutions for homeland security. The EMERGE Accelerator Program, Prize Program, and connectivity to In-Q-Tel are specifically designed to engage and partner with non-traditional performers to develop innovative technologies and approaches for homeland security needs. S&T continues to work with other Departments and Agencies to identify successful approaches to engage the full range of performers.

- **Impact:** These programs broaden S&T's reach to innovators by working with a variety of startups, accelerators, incubators, and other non-traditional partners to find commercial technology that is adaptable for use by the homeland security enterprise. Influencing commercial technology supports S&T's goal to ensure transition of technology to end-users to close homeland security gaps. These capabilities allow DHS S&T to leverage investments by other Government Agencies and the private sector. In addition, access to these partner networks supports S&T technology scouting efforts by increasing awareness of emerging technologies to inform S&T investments.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Budget	-	1,000	3,000	3,000	3,000
Obligations	-	963	1,326	233	

Budget Year Key Milestone Event (FY 2018)

- Execute a targeted industry engagement campaign to convey to non-traditional partners S&T's key priorities and available mechanisms for partnering with S&T.
- Integrate information on developing technologies within non-traditional partner networks into S&T**'s** technology scouting process.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Conduct Prize Competition: NBAF Think and Do Challenge	FY 2016	FY 2016
Conduct Prize Competition: USCG Environmentally Friendly Replacement of Buoy Morring Systems	FY 2016	FY 2016
FY 2017		
Conduct Prize Competition:TSA Person Screening Algorithm	FY 2017	FY 2018
Conduct Prize Competition: Biothreat Early Warning Challenge	FY 2017	FY 2018
Conduct Prize Competition: Pocket Escape Mask Design Challenge	FY 2017	FY 2018
Conduct *EMERGE* Wearables Accelerator	FY 2017	FY 2017
FY 2018		
Conduct Prize Competition: Entry and Exit Point People Screening	FY 2018	FY 2018

Type of Research

Applied

Technical Readiness Level
TRL will vary between specific portfolio projects.

Transition Plans
Transition Plans vary based on the specific problem statement and final results of the competition, accelerator, call, and/or work program.

Biometrics Technology Engine (BT-E)

- **Problem:** Biometric technologies are playing an increasingly significant role in securing the Homeland against dynamic threats, yet S&T lacks a coordinated approach to developing and pushing biometric solutions and innovations to DHS operational components.

- **Solution:** The Biometrics Technology Engine (BT-E) will provide a sustainable, common platform for driving biometrics standards, best practices, and innovation across S&T, DHS, and the Homeland Security Enterprise (HSE). The BT-E will coordinate and expand upon S&T's biometric competencies to provide world-class biometric expertise, methods, tools, technology, best practices, industry and international coordination, and operational insight to address the dynamic biometric needs of DHS and the HSE.

- **Impact:** The BT-E will accelerate effective integration of biometrics technologies into Apex programs and Component operations, and work in a cross-cutting fashion to mitigate potential inefficiencies, further driving down costs and increasing operational impact.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Budget	-	-	-	-	408
Obligations	-	-	-	-	

FY 2018 Planned Key Milestone Events (Budget Year)

- Engage JRC, DHS Components, and HSE partners to identify common unmet operational needs.
- Formalize Biometric Technology Evaluations to inform or streamline DHS technology acquisitions.
- Demonstrate and evaluate cloud-based biometric matching and fusion capabilities, in collaboration with DA-E and IDAM-E.

- Co-lead multi-agency biometrics challenge prize for bleeding edge Nail-to-nail fingerprint collection technologies.
- Develop portfolio of S&T biometric offerings that positively impact Apex programs and Component operations.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Develop foundational documents (e.g., charter, factsheets, etc)	FY 2017 Q3	FY 2018 Q1
Compile and analyze S&T portfolio of biometric programs to include: working groups, capabilities, use cases, and customers	FY 2017 Q3	FY 2018 Q2
FY 2018		
Develop strategic messaging and engage DHS, interagency, industry, and international stakeholders	FY 2018 Q1	FY 2018 Q4
Build, maintain, and grow an accessible biometric "body of knowledge" for the HSE	FY 2018 Q1	FY 2018 Q4
Develop and promulgate BT-E capability offerings to DHS, interagency, industry, and international stakeholders	FY 2018 Q1	FY 2018 Q2
Contribute to the enhancement of biometric technologies, standards, and best practices in coordination with relevant entities (e.g. NIST), and drive adoption of biometric standards across the HSE	FY 2018 Q1	FY 2018 Q4
Execute test and evaluation activities at the Maryland Test Facility in collaboration with HSE stakeholders to assess innovative technologies	FY 2018 Q1	FY 2018 Q4

Type of Research

Developmental

Technical Readiness Level

TRL 6

Transition Plans

FY 2018 - Deliver Final Technology and Process Assessment report for Biometrics Technology Refresh and Deliver an initial biometrics "body of knowledge". Transition: Apex program to DHS and HSE.

3. Border Security – FY 2017 Annualized Continuing Resolution: $56.749M. FY 2018 Request: $48.401M. 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 2017 Annualized Continuing Resolution: $21.726M. FY 2018 Request: $4.544M. 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:** Air Cargo is a critical component of the Aviation Security Triad consisting of Air Cargo, Checked Baggage, and Checkpoint Baggage. Almost fifty percent of the contents in a passenger aircraft are Cargo and almost all US commercial carrier passenger flights carry Air Cargo. Screening of Air Cargo is mandated by Public Law 110-52 which dictates 100% screening of air cargo on passenger aircraft and that it must be screened commensurate to the same level as checked baggage. Additionally, DHS Strategic Priority #1 is to prevent terrorism and enhance security per 2014 QHSR. Screening checked and checkpoint baggage without equivalent screening of air cargo is like screening only half the passenger baggage and expecting to be safe. In response to the Congressional mandate, TSA instituted the Certified Screening Facility program to screen all air cargo using TSA approved screening equipment. Since private screening companies are low margin facilities, screening equipment has to be affordable. Evolving threats pose a continual threat to passenger safety through the Air Cargo conduit. Current screening techniques are labor intensive and IATA projected increase in Air Cargo volume would make it impossible to handle future Air Cargo throughput requirements in a secure manner in the next two to five years.

- **Solution:** The Air Cargo program aims to (a) augment existing screening systems to support increased security in the short term, (b) develop low cost CT-like systems, for 3D imaging of skids, and automated threat detection in the midterm, and (c) develop technologies to screen dense cargo using high penetration screening systems in the long term. The program seeks to achieve these goals in order to meet TSA capability gaps identified by close collaboration between TSA, S&T, OEMs and Screening Companies. The program plan builds capability in a graduated manner through incremental funding of programs based on approved funding. Thus elimination of funding will result in incomplete projects that dead end in a manner that prior funding would also be a waste of money.

- **Impact:** Air passenger safety remains uncompromised with the development of effective and affordable air cargo screening systems. Procurement of these systems by the Certified Cargo Screening Facilities enhances TSA's ability to maintain air cargo screening effectiveness and promptly address evolving air cargo threats.

Overall Project Funding

	2014	2015	2016	2017	2018
Project Funding	2,000	5,000	5,200	7,476	0
Obligations	1,800	4,448	4,708	0	-

FY 2016 Key Milestone Events (Prior Year)

- Deliver second findings of "ground truth" Improvised Explosive Device (IED) Cargo Build Studies – Report on second threats.

FY 2017 Key Milestone Events (Year of Execution)

- Deliver Residue Studies report provided by Massachusetts Institute of Technology's Lincoln Laboratory to TSA's Air Cargo Program to assist in development of new Explosives Trace Detection (ETD) detection thresholds. Deliver firm findings on "ground truth" IED Cargo Build Studies – Report on final six threats.
- Conduct a preliminary design review on study to evaluate explosives trace detection vapor trace effectiveness, which will be a review of the test design and methodology to be used including test articles.
- Conduct critical design review on study to evaluate explosives trace detection vapor trace effectiveness, which will be a review of the specific test design implementation and test procedure to be used to collect the study data for analysis.
- Conduct a preliminary design review for Opacity and Complexity Analysis Screening Tool (OCAST).
- Complete review and analysis of test results of enhanced Explosives Trace Detection.
- Complete review of Long Range Broad Agency Announcement (LRBAA) proposal submissions received in response to topic area 3.0 of LRBAA14-02.

FY 2018 Key Milestone Events (Budget Year)

- N/A

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Trace Residue Characterization studies	FY 2016 Q1	FY 2017 Q2
FY 2017		
Develop low cost CT-like 3D imaging PDR	FY 2017 Q2	FY 2018 Q2
Develop Automated Operator Assist Tools, OCAST PDR	FY 2017 Q2	FY 2017 Q4
Vapor Detection of Explosives in Air Cargo	FY 2017 Q2	FY 2018 Q2
Air Cargo Trace Residue Characterization Studies	FY 2017 Q3	FY 2020 Q1

Type of Research
Developmental

Technical Readiness Level
Low cost CT-like 3D imaging. This program plans to begin at TRL 3 and end at TRL 6.

Develop high penetration cargo skid size screening capability PDR. This program plans to begin at TRL3 and end at TRL 6.

Transition Plans

When the CT and the high penetration air cargo skid scanners reach TRL level 6 (successful DT&E at TSL) the products would be available to TSA for certification testing. On successful certification the TSA will place these products on the Air Cargo Screening Technology List (ACSTL). This will then allow the Certified Cargo Screening Facilities to procure and use these products.

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. POEs is projected to increase from year to year while CBP manpower will not be increased proportionately. As such, new or improved technology and technical studies 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 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 POEs, freeing up thousands of hours/year of CBP labor.

Overall Project Funding

	2014	2015	2016	2017	2018
Project Funding	3,450	-	-	1000	0
Obligations	1,971	921	242	2,163	

FY 2016 Key Milestone Events (Prior Year)

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

FY 2017 Key Milestone Events (Year of Execution)

- Develop draft requirements and Concept of Operations for CITRUS data analytic tool.
- Refine operational test and evaluation plan for cargo trend analysis and anomaly detection system.

- Deliver a formal report assessing the utility of the Federal Highway Administration Radio Frequency Identification (RFID) commercial wait time solution as a tool to assist the accurate collection and dissemination of wait times at distinct crossings on the U.S. - Mexico border.

FY 2018 Key Milestone Events (Budget Year)

- N/A

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Refine operational test and evaluation of cargo trend analysis and anomaly detection into CBP's automated targeting system	FY 2017 Q2	FY 2017 Q3
Develop draft requirements and Concept of Operations for data analytic tool for CITRIS User Interface	FY 2017 Q3	FY 2017 Q4
Develop and test software for Cargo Trend Analysis	FY 2017 Q4	FY 2018 Q2

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- 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.
- Deliver to CBP an ATS-integrated cargo trend analysis and anomaly detection capability

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.

Overall Project Funding

	2014	2015	2016	2017	2018
Project Funding	8,406	8,300	6,784	1,000	0
Obligations	4,877	6,873	5,586	258	-

Prior 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.

Current Year Key Events

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

Budget Year Key Events

None

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).

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.

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/ICE has limited ability to detect/interdict counterfeit merchandise entering the U.S. and ICE seized $66 million in bulk cash being illegally smuggled out of the U.S. in FY 2016.

- **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 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.

Overall Project Funding

	2014	2015	2016	2017	2018
Project Funding	2,600	3,600	487	6,400	0
Obligations	2,390	3,323	0	414	

FY 2016 Key Milestone Events (Prior Year)

- Initiate transition of Mid-Level Scanning System Upgrade.
- Initiate transition of pre-production Mobile Backscatter Scanning System.
- Initiate transition of Currency Detection System.

FY 2017 Key Milestone Events (Year of Execution)

- Develop common non-intrusive inspection (NII) capability from Mid-Level Scanner and Mobile Backscatter Scanner to improve performance of future NII systems.
- Conduct Operational Pilot of Common Viewer Workstation under real conditions.

FY 2018 Key Milestone Events (Budget Year)

- N/A

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Develop common NII capability from Mid-Level Scanner and Mobile Backscatter Scanner to improve performance of future NII systems	FY 2016 Q3	FY 2017 Q2
FY 2017		
Conduct Operational Pilot of Common Viewer Workstation under real conditions	FY 2017 Q4	FY 2018 Q1
Perform Test and Evaluation of prototype Void & Deck Anomaly Detector	FY 2017 Q3	FY 2018 Q3
PerformTest and Evaluation of prototype Mobile Backscatter Scanning System	FY 2017 Q4	FY 2018 Q4

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- Transition to CBP (and potentially TSA) a Common Viewer Workstation for non-intrusive inspection systems.
- Transition operational prototype Through the Wall/Floor Detection System for field evaluation at selected POEs. S&T will assist CBP with acquisition or commercialization.
- Transition 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.
- 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. S&T will assist CBP with acquisition or commercialization.

People Screening

- **Problem**: Increases in international travel have strained CBP resources, resulting in increased wait times and delays for passengers to clear Federal Inspection Service areas. CBP needs to introduce process and technology improvements to traveler inspection operations in order to strengthen traveler vetting and facilitate lawful and legitimate travel.

- **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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	5,850	3,544
Obligations	-	-	-	414	

FY 2016 Key Milestone Events (Prior Year)

N/A

FY 2017 Key Milestone Events (Year of Execution)

- 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.

- Deliver Business Case Report for Global Entry Evolution to support CBP acquisition planning.
- Conduct a pilot 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.
- Perform test, evaluation, and analysis of new commercially available biometric technologies to assess performance, and determine business case for potential integration into DHS operations.

FY 2018 Key Milestone Events (Budget Year)

- Deliver Business Case Analysis Report for counting and measuring to support CBP acquisition planning.
- Deliver Operational Readiness Assessment Report for Global Entry Evolution.
- Conduct non-contact fingerprint operational readiness assessment demonstration for biometrics technology refresh.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Conduct technology readiness evaluations of fingerprint, face, and iris biometric recognition capabilities	FY 2017 Q1	FY 2017 Q4
Perform Field Trial of Bluetooth/IR System in operational Federal Inspection Services (FIS) environment for passenger Counting & Measuring	FY 2017 Q2	FY 2017 Q3
Conduct operational readiness assessments of non-contact fingerprint, speaker, face, and iris biometric recognition capabilities	FY 2017 Q4	FY 2018 Q3
Develop Global Entry Operational Readiness Assessment Report	FY 2017 Q2	FY 2018 Q1
FY 2018		
Pilot Global Entry Technology and CONOPS at selected Federal Inspection Service (FIS) area	FY 2018 Q1	FY 2018 Q2
Develop Business Case Analysis Report for Counting and Measuring to support CBP acquisition planning	FY 2018 Q2	FY 2018 Q4

Type of Research

Developmental

Technical Readiness Level

The program begins at TRL3 and ends at TRL7.

Transition Plans

- All analyses, models, technology prototypes, and knowledge products will be transitioned to CBP. Select work products may also be shared with airlines, airports, and other travel industry stakeholders to facilitate adoption and integration into aviation operations. Products include all operational assessment reports and business case documentation for follow-on CBP acquisition and/or sustainment to include Business Case Analysis and foundational acquisition documentation.

POE Forensics and Investigations

- **Problem**: CBP and ICE have limited capability to collect and analyze forensics evidence from cargo and cargo containers to enforce trade law. DHS is heavily dependent on commercial laboratories to process forensics information 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. For example, Pollen sample analysis demands have more than doubled in the last 10 years. Similarly, DHS's limited capability to collect and analyze DNA samples from cargo and packages limits their ability to support prosecution of illegal activity. In addition, ICE has the need to share, query and analyze law enforcement investigations information on combatting transnational crime, investigating child exploitation and human trafficking, and processing aliens.

- **Solution**: This project provides CBP and ICE with the capability to detect and prosecute illegal activity through the forensic analysis of material collected from suspicious packages and cargo. The project also provides law enforcement entities access to near real-time data to enhance investigation and interdiction of illegal activity.

- **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 to support the U.S. economy. Integrated and timely access to investigations data can help detect and interdict illicit activity associated with human trafficking, child exploitation, and illegal immigration.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	-	1,000
Obligations	-	-	-	-	

FY 2018 Key Milestone Events (Budget Year)

- Perform an assessment of current networking tools in use by ICE – and others potentially available to ICE – to advance their investigative capabilities for combatting transnational crime and advancing child exploitation investigations.
- Perform a threat assessment to intellectual property rights as they relate to export controls and Additive Manufacturing (3-D printing) for the purpose of identifying methods for investigating/intercepting the process and resulting counterfeit goods.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Working with DoD, CBP, FBI and others, survey networking options available to ICE, as well as the processes for shared implementation.	FY 2018 Q1	FY 2018 Q4
Perform a threat assessment related to 3-D printing/additive manufacturing and intellectual property theft	FY 2018 Q1	FY 2018 Q2
Working with the National Intellectual Property Rights Coordination Center (IPRCC), survey potential processes and/or technologies that can be used to intercept counterfeit products	FY 2018 Q2	FY 2018 Q4

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.
- Transition to ICE enhanced networking tools to advance their investigative capabilities for combatting transnational crime and advancing child exploitation investigations.
- Transition to ICE enhanced processes and tools to advance their detection and interdiction of intellectual property theft and any resulting counterfeit products.

B. Land Border Security – FY 2017 Annualized Continuing Resolution: $21.773M. FY 2018 Request: $27.808M. 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 reliably and accurately detect, track, and classify all low, medium, and high altitude threats including ultralights, gyrocopters, helicopters, and fixed wings. 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. The difficult terrain and harsh environment of the northern and southern borders 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 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. This project will also work with S&T's Program Executive Office for Unmanned Aircraft Systems to assist with UAS-specific operations.

- **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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	2,618	5,250	1,468	7,173	6,879
Obligations	4,568	4,072	325	465	

FY 2016 Key Milestone Events (Prior Year)

- Demonstrate dismount movement target indicator on medium altitude long endurance UAS.
- Commence Operational Evaluation of Moving Target Indicator technology.
- Assess issues and recommend solutions to nonstandard UAS data protocols that prevent Unmanned Air Vehicle (UAV) track data or video from being readily ingested by data management systems.

FY 2017 Key Milestone Events (Year of Execution)

- Modify existing SDA system to accommodate Southern Border changes.

FY 2018 Key Milestone Events (Budget Year)

- Demonstrate mission management system with data link for real time sensor feed.
- Initiate integration of a maritime surveillance ISR sensor.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Build prototype Mission Management system	FY 2017 Q3	FY 2018 Q1
FY 2018		
Deploy/Demonstrate/Test Mission Management System prototype	FY 2018 Q1	FY 2018 Q4
Transition Mission Management System	FY 2018 Q4	FY 2019 Q3
Develop/Issue/Award RFP for maritime surveillance ISR Sensor System	FY 2017 Q3	FY 2018 Q2
Build, integrate and demonstrate maritime ISR Sensor system	FY 2018 Q2	FY 2019 Q2

Type of Research
Developmental

Technical Readiness Level
TRL will vary between specific portfolio projects.

Transition Plans
- Deliver to CBP and USCG operational evaluations of aircraft mounted ISR sensors to include performance, procurement, and integration data.
- Deliver to CBP and USCG a Mission Management system including performance, procurement, and integration data.

Private Sector Outreach and Engagement (formerly Border Trident Spectre)
- **Problem:** DHS needs the ability to rapidly field prototypes and potential COTS solutions for use and assessment with homeland security operators. This ability informs decisions on how to address technological capability gaps identified through the DHS IPTs and gathers input for future acquisitions.

- **Solution:** This project enables delivery of high-priority technology prototypes to the field. This project can assess COTS or near-COTS solutions for use in areas of critical need for border security and other high-priority homeland security needs. The need will

be identified by CBP and/or other DHS stakeholders, the near-term requirements will be jointly evaluated, and S&T will seek one or more technologies for field use and evaluation.

- **Impact:** This project will enhance DHS understanding of operator needs and provide the ability to quickly assess available technology to improve capabilities and/or reduce O&M costs of existing capabilities. In addition, this project captures experimentation events occurring within the interagency community that could be leveraged by DHS to further support S&T technology scouting efforts.

Overall Project Budget

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Budget	-	1,400	500	2,100	500
Obligations	-	1,400	419	0	

Prior Year Key Milestone Events (FY 2016)

- Developed, tested, and evaluated technology (i.e., COTS and near-COTS) solutions.
- Delivered test reports and recommendations to CBP customer(s).
- Identify critical CBP capability gaps or area of potential cost savings, conducted in partnership with CBP Office of Technology, Integration and Acquisition (OTIA).
- Conducted detailed interviews of customer staff and field officers to define/validate requirements for rapid evaluation and integration of COTS and near-COTS technology.
- Performed tech foraging and an analysis of alternatives (with strong customer and user input) to identify a tech development strategy.

Current Year Key Milestone Events (FY 2017)

- N/A

Budget Year Key Milestone Events (FY 2018)

- Participate in additional Operational Experimentation events to inform and support DHS Component priorities.
- Capture observations and technologies from Operational Experimentation events to support technology scouting.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Participate in planning and execution of border security-related OpEx	FY 2017 Q3	FY 2017 Q4
FY 2018		
Participate in planning and execution of additional OpEx to support specific HSE needs	FY2018 Q1	FY 2018 Q1
OpEx opportunities identified for high-priority S&T programs	FY 2018 Q1	

Type of Research

Applied

Technical Readiness Level

TRL will vary based on individual vendor technologies expected to participate.

Transition Plans

Determined and developed based on Operational Experimentation observations and feedback.

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, visibility and situational awareness of activity on both sides of a Border Wall infrastructure is critical to Agent safety and to the protection of U.S. assets and infrastructure.

- **Solution**: The projects address research and development gaps identified by Border Security IPTs, and U.S. Border Patrol Strategic Plan. 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. This project is also enabling capabilities to provide situational awareness above and below ground with the construction and deployment of a Border Wall. An integrated and layered approach will prevent adversaries from exploiting other border security mission areas (e.g. Maritime, Air, Ports of Entry).

- **Impact**: CBP's improved situational awareness of U.S. terrestrial borders between the POEs will result in higher interdiction rates

of illegal activity and immigration through higher detection rates, fewer false alarms, and more efficient and safer utilization of officers, agents, and assets.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	5,219	7,300	7,261	8,200	15,729
Obligations	6,766	8,156	6,452	90	

FY 2016 Key Milestone Events (Prior Year)

- Transitioned Slash CameraPole (1 pole configuration).
- Tested SBIR UGS system by Independent Government team. Demonstrate Remote Imaging Device Engineering capability.

FY 2017 Key Milestone Events (Year of Execution)

- Conduct Border Wall technology requirements analysis for Border Research in Instrumented Construction (BRIC) effort.
- Conduct Remote Radio Link Pilot Preliminary Design Review for radio communications.
- Install three pole configuration of the slash Camera Pole system.
- Conduct assessment of a method to manage the amount of video collected for investigations.
- Transition Fiber Optic Distributed Sensing to provide high probability of detection and enhance classification capability to discriminate between humans, animals, vehicles, and aircraft without the use of imagers.

FY 2018 Key Milestone Events (Budget Year)

- Pilot Border Wall technology capabilities under BRIC effort.
- Install Northern Border Fiber Optic Distributed Sensing System Pilot.
- Conduct a Design Review of method to capture and distribute video and audio to improve situational awareness.
- Conduct multi-season Test and Evaluation for RF Sensing UGS.
- Conduct multi-season Test and Evaluation for Tri-Axial Acoustic Sensor Units.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Conduct assessment of a method to manage the amount of video collected for investigations	FY 2016 Q4	FY 2017 Q3
Conduct assessment of method to detect the presence of humans in an area under surveillance.	FY 2017 Q1	FY 2018 Q4
FY 2017		
Conduct a Design Review of method to capture and distribute video and audio to improve situational awareness	FY 2017 Q2	FY 2018 Q2
Conduct multi-season Test and Evaluation for RF Sensing UGS	FY 2017 Q3	FY 2018 Q4
Conduct multi-season Test and Evaluation for Tri-Axial Acoustic Sensor Units	FY 2017 Q3	FY 2018 Q4
Install 2nd single pole configuration of the slash Camera Pole system	FY 2017 Q3	FY2017 Q4
Conduct Border Wall technology requirements analysis for Border Research in Instrumented Construction (BRIC) effort	FY 2017 Q4	FY2017 Q4
Conduct FODS Northern Border Pilot Preliminary Design Review for radio communications	FY 2017 Q4	FY 2017 Q4
Transition Fiber Optic Distributed Sensing Southern Border Pilot	FY 2017 Q1	FY 2017 Q4

Type of Research

Developmental

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- Transition Fiber Optic Distributed Sensing to CBP 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 technology to improve CBP's ability to detect and classify illegal border incursions.
- Transition Border Wall situational awareness capabilities to CBP for the BRIC effort.
- Transition UGS technology to CBP to improve the detection and tracking illegal incursions.
- Transition "trigger" sensor to ICE that detects the presence of humans in the field of view for the purpose of reducing the volume of video to be recorded, transmitted, viewed and archived.

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 and 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 S&T's developed tunnel detection tools and systems CBP will be able to accurately detect and locate clandestine tunnels. 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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	4,626	5,800	4,119	4,300	4,700
Obligations	3,975	5,174	4,018	641	

FY 2016 Key Milestone Events (Prior Year)

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

FY 2017 Key Milestone Events (Year of Execution)

- Perform Market Survey of Unmanned Ground Systems (aka Tunnel Robots).
- Develop sensor requirements for Unmanned Ground Systems (aka Tunnel Robots).
- Conduct a Field Test for Developmental Prototype of the complete Tunnel Detection System at the border.
- Test prototype Tunnel Detection system with CBP and provide a draft Technical Data Package to the Acquisition Program Office.

FY 2018 Key Milestone Events (Budget Year)

- Conduct field test and evaluation of tunnel robot technologies with Border Patrol in tunnel test bed.
- Test prototype of integrated Tunnel Detection system with CBP.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Plan and perform a Field Test Developmental Prototype of Tunnel Detection Sub-Systems	FY 2016 Q2	FY 2016 Q4
Plan and conduct a Field Tests for Developmental Prototype of the complete Tunnel Detection System at the border	FY 2016 Q3	FY 2017 Q3
FY 2018		
Plan and operationally test prototype integrated Tunnel Detection system with CBP.	FY 2018 Q1	FY 2018 Q4
Perform Market Survey of Unmanned Ground Systems (aka Tunnel Robots)	FY 2017 Q1	FY 2017 Q3
Plan and conduct field test and evaluation of tunnel robot technologies with Border Patrol in tunnel test bed	FY 2018 Q1	FY 2018 Q3

Type of Research

Developmental

Technical Readiness Level

The program starts at TRL2 and ends at TRL6.

Transition Plans

- Tunnel Detection Prototype:
  - Delivered to CBP a Sensor Performance Tool and Guidebook to inform which sensor types work best in the various border locations and the confidence level using each.
  - 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.
- Deliver a Tunnel Age toolkit that can be routinely used by CBP and ICE agents to analyze and determine the age of discovered tunnels.
- Deliver to CBP and ICE operational evaluations of Unmanned Ground Systems (aka Tunnel Robots) to include performance, procurement, and integration data.

Maritime Border Security – FY 2017 Annualized Continuing Resolution: $13.250M. FY 2018 Request: $16.050M. 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*

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	7,250	9,500	6,866	11,500	8,750
Obligations	5,735	9,355	6,861	2,950	

FY 2016 Key Milestone Events (Prior Year)

- 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 Maryland Natural Resources Police (MNRP) node.
  - Expand accredited boundary to Air & Marine Operations Center (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.
- Plan and execute Technical Demonstration (TD-2).

FY 2017 Key Milestone Events (Year of Execution)

- Establish an initial operational capability at CBP Air and Marine Operations Center for the use of space based imagery in tactical operations.
- Complete Integrated Maritime Domain Enterprise-Coastal Surveillance System (IMDE-CSS) Operational Demonstration.
- Deliver to DHS HQ an affordable, sustainable, OCIO-compliant, enterprise data integration/information sharing platform.

FY 2018 Key Milestone Events (Budget Year)

- Perform IMDE-CSS Operational Assessment.

- Assess the impact of using commercial space based imagery for maritime surveillance operations.
- Perform an Analysis of Alternatives for maritime domain awareness.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Install, test, and evaluate Coastal Surveillance System (CSS) operational nodes at strategic locations to improve U.S. maritime domain awareness	FY 2016 Q1	FY 2016 Q4
Plan and execute Integrated Maritime Domain Enterprise (IMDE) -Coastal Surveillance System (CSS) Operational Assessment	FY 2016 Q1	FY 2018 Q4
Establish an initial operational capability at CBP Air and Marine Operations Center for the use of space based imagery in tactical operations	FY 2016 Q1	FY 2017 Q3
FY 2017		
Assess the impact of using commercial space based imagery for maritime surveillance operations	FY 2017 Q1	FY 2018 Q1
Perform Analysis of Alternatives for maritime domain awareness	FY 2017 Q4	FY 2018 Q4

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 OCIO 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 maritime surveillance operations.

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 DHS maritime security and safety operations in the Arctic, including maritime domain awareness and voice and data communications.

- **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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	750	-	1,000	6,300
Obligations	-	425	-	805	

FY 2017 Key Milestone Events (Year of Execution)

- Deliver Adaptive Space-based Analytics Prototype (ASAP) reference architecture.
- Evaluate technology with the potential to improve/enhance mission performance.

FY 2018 Key Milestone Events (Budget Year)

- Perform Analysis of Alternatives (AoA) for Arctic Communications.
- Conduct On-Orbit Test and Evaluation of space-based technologies to support arctic missions.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Evaluate satellite technology with the potential to improve/enhance mission performance	FY 2016 Q2	FY 2017 Q4
Launch Hawkeye 360 (HE360), National Reconnaissance Office (NRO), Air Force Operationally Responsive Space (AF ORS) satellites	FY 2016 Q4	FY 2018 Q2
Plan for and conduct On Orbit Test and Evaluation of satellites to support arctic missions	FY 2016 Q4	FY 2018 Q4
FY 2017		
Develop ASAP Tool(s)	FY 2017 Q2	FY 2017 Q4
Limited Demonstration of ASAP	FY 2017 Q2	FY 2018 Q3
Integrate DoD Synthetic Aperture Radar (SAR) into ASAP	FY 2017 Q1	FY 2019 Q1
Perform an Analysis of Alternatives for Communications in the Arctic Region	FY 2017 Q4	FY 2018 Q2

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 Maritime Domain Awareness capability.
- The project will inform a DHS acquisition strategy for the deployment of an Arctic Communications capability.
- Analytic capabilities developed will transition to become enterprise systems.

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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	750	1,000
Obligations	-	-	-	0	

FY 2017 Key Milestone Events (Year of Execution)

- Assess enterprise architecture alignment.
- Perform Program of Record database assessment.

FY 2018 Key Milestone Events (Budget Year)

- Develop prototype port resiliency analytical tool that uses available computer-based technologies to provide port managers with a more effective capability to manage ports.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Assess enterprise architecture alignment	FY 2017 Q2	FY 2017 Q4
Perform Program of Record database assessment	FY 2017 Q3	FY 2017 Q4
Develop prototype port resiliency analytical tool	FY 2017 Q4	FY 2018 Q4

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.

4. Chemical, Biologial and Explosive Defense Research and Development (CBE Defense) – FY 2017 Annualized Continuing Resolution: $58.389M. FY 2018 Request: $52.641M. 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 includes: 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 by providing technology, methods, and procedures to detect CBE threats.

Bioagent Detection – FY 2017 Annualized Continuing Resolution: $18.079M. FY 2018 Request: $21.000M. 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.

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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	7,273	750	2,000	3,099	0
Obligations	7,284	289	1,599	0	

Prior 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.

Current 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.

Budget Year Key Events

- N/A

Project Schedule Including Milestones

N/A

Type of Research

Developmental

Technical Readiness Level

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

Transition Plans

N/A

Bioassays

- **Problem:** Numerous capability gaps exist for the analysis and identification of biothreat agents for CBD internal customers and IPT members, e.g., USSS, CBP, and First Responders Group (FRG). Comprehensively-validated biothreat agent detection assays and devices are being developed to enable the analysis of potential biothreat samples to inform on appropriate actions to enhance protection functions and ensure public safety.

- **Solution:** Development of "Gold Standard" repositories of high quality viral and bacterial agent samples to enable development, transition and operational use of robust dual-use detection and diagnostic assays for both field-based and laboratory use. The spectrum of dual-use assay development projects include 1) test, evaluation, and validation of nucleic acid detection assays (TaqMan Polymerase Chain Reaction (PCR)); 2) antigen detection assays (immunoassays); as per the Public Health Actionable Assay (PHAA) standards and First Responder Actionable Assay (FRAA) performance criteria; and 3) rapid antimicrobial susceptibility assays (based on micro-culture and PCR) for deployment and employment through the IPT customers and internal DHS components. Closes gaps to support rapid detection of an event, response 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, and confirmation of biothreat agent identification, while the FRAA assays are primarily Lateral Flow Devices, and are strictly designed to be used in the field by First Responders for environmental powders evaluation and screening.

- **Impact:** Enables and expands capabilities to rapidly screen and detect high-consequence biological pathogens and toxins to provide critical information to support protection functions, and actions and decisions regarding public safety. The success of this project is dependent on the development and maintenance of robust reference strain collections and antibody repositories, to include appropriate standards to recognize and identify traditional, emerging, advanced, and enhanced threat agents, and bioinformatic resources for assay design and analytic capabilities to assess and predict robust assay performance.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Budget	7,000	4,000	2,000	5,165	3,000
Obligations	4,653	6,076	2,628	330	

FY 2016 Key Milestone Events (Prior Year)

- Conduct assay optimization for the Coxiella burnetii PHAA assay.
- Complete Rapid Antimicrobial Susceptibility tests for Burkholderia mallei and pseudomallei.
- Conduct testing and validation of the nucleic acid based detection assays for Burkholderia spp.

FY 2017 Key Milestone Events (Year of Execution)

- Design Review for Multiplexed Toxin Detector (SpinDx Platform): Finalize prototype platform and tests in advance of developmental testing and evaluation.
- Establish the form, shape, and size of an aerosol sample capture cassette, to include assay chemistry for viable capture and detection of signatures.
- Transition nucleic acid based detection assays for Burkholderia spp. (causing Glanders or Melioidosis) and Bacillus anthracis (causing Anthrax) to end users and stakeholders.
- Acquire materials for the development of the T2 Mycotoxin and Saxitoxin toxin PHAA assays.
- Transition of Rapid Antimicrobial Susceptibility tests for Burkholderia mallei and pseudomallei to end users.
- Begin transitioning and validation of multiplexed Variola antigenic assays on the MesoScale Defense (MSD) Platform
- Complete testing, evaluation and validation of field deployable First Responder Actionable Assays for detection of Bacillus anthracis.

- Transition of nucleic acid based detection assays for Burkholderia spp. (causing Glanders or Melioidosis) and Bacillus anthracis (causing Anthrax) to end users and stakeholders.
- Conduct assay optimization of Lassa Fever Virus PHAA assays.

FY 2018 Key Milestone Events (Budget Year)

- Conduct bridging studies and transition validated nucleic acid-based PHAA to USSS.
- Transition multiplex toxin detector platform (SpinDx) and assays to USSS.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Begin Validation of Conotoxin and Saxitoxin reagents and prototype assays.	FY 2016 Q4	FY 2018 Q4
Transition of Rapid Antimicrobial Susceptibility tests for Burkholderia mallei and pseudomallei to end users.	FY 2016 Q1	FY 2017 Q4
Begin transitioning and validation of multiplexed Variola antigenic assays on the MesoScale Defense (MSD) Platform.	FY 2016 Q1	FY 2018 Q1
Finalize design of SpinDx assay disk and conduct testing and evaluation of prototype toxin detection platform and assays to USSS.	FY 2016Q1	FY 2018 Q2
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 2016 Q4	FY 2017 Q4
FY 2017		
Begin optimization of Brucella spp. prototype TaqMan assays.	FY 2017 Q4	FY 2018 Q4
Conduct bridging studies and transition validated nucleic acid-based PHAA to USSS	FY 2017 Q3	FY 2018 Q4

Type of Research

Applied

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

Transition Plans
Transition validated assays to USSS and other DHS Components to support protection, national bio-preparedness defense missions. 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. The timely detection of a biological threat and/or an infectious agent prior to release and/or exposure in a public space is a critical challenge to multiple DHS components including CBP, USSS as well as within Federal, State, local, and tribal governments, including the public health and first responder communities.

- **Solution:** This project develops cost-effective systems to rapidly collect and exploit information useful for identifying outbreaks or unusual events, enabling decision makers to more quickly initiate protective measures. Demonstrations will be conducted in partnership with DHS components and stakeholders.

- **Impact:** Detection and interdiction of biologial hazards through rapid field based biological assessment and optimized collection and integration of relevant data will shorten the timeline between event occurrence and response; thereby, protecting the public, critical infrastructure, and the economy.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Budget	1,046	6,900	10,000	9,814	5,000
Obligations	659	11,899	7,608	379	

FY 2016 Key Milestone Events (Prior Year)

- 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.

FY 2017 Key Milestone Events (Year of Execution)

- Conduct first full scale exercise of improved biosurveillance capabilities with a local jurisdiction partner, and document lessons learned and technology gaps.
- Deliver a report to DHS component stakeholders that characterizes the state-of-the-art for technology directly applicable to field based biological assessment and collect input on the feasibility of implementing currently available technology.
- Produce a notional roadmap of potential RDT&E pathways for reaching needed capability via commercial and government off the shelf solutions.
- Initiate requirements and analysis of alternatives for advanced outdoor detection systems.

FY 2018 Key Milestone Events (Budget Year)

- Pilot field testing and installation of rapid and sustainable environmental monitoring systems with a local community partner for indoor venues.
- Establish proposed system architecture for field based biological assessment capability for CBP primary active surveillance at Ports of Entry that will not unreasonably restrict cross-border traffic.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Conduct component interviews to develop detailed requirements and concept of operations for field based biological assessment.	FY 2017 Q2	FY 2017 Q3
Interagency interviews of CBP partners to document interagency component of field-based biological assessment concept of operations.	FY 2017 Q2	FY 2017 Q3
DHS component consensus requirements for field based biological assessment.	FY 2017 Q2	FY 2017 Q4
Conduct review of relevant literature focused on prior related efforts intended either to provide needed capability or mitigate impact of capability gaps.	FY 2017 Q3	FY 2017 Q4
Request for Information on field based biological assessment efforts and technologies directly applicable to field-based biological assessment released.	FY 2017 Q3	FY 2017 Q3
Summary of information received from RFI on field based biological assessment finalized.	FY 2017 Q4	FY 2017 Q4
FY 2018		
Report identifying potential threat characteristics and signatures for the infectious cycle of each of the DBPs and characterizing those signatures across the likely/known sensor range.	FY 2018 Q1	FY 2018 Q3
Report assessing overall threat detectability with options for detection strategies and methodologies.	FY 2018 Q1	FY 2018 Q3
Conduct feasibility study to assess primary barriers to field based biological assessment (technical, operational, legal, etc) and identify test and verification/validation strategies for field based biological assessment technologies.	FY 2017 Q2	FY 2018 Q3

Research & Development Description	Plan Start Date	Planned Completion
Draft options for system architecture for field based biological assessment capability for Customs and Border Protection primary active surveillance at Ports of Entry that will not unreasonably restrict cross-border traffic presented to CBP and CDC stakeholders.	FY 2018 Q3	FY 2018 Q3
Final proposed system architecture for field based biological assessment capability for Customs and Border Protection primary active surveillance at Ports of Entry that will not unreasonably restrict cross-border traffic presented to CBP and CDC stakeholders.	FY 2018 Q4	FY 2018 Q4
Pilot field testing and installation of rapid and sustainable environmental monitoring systems with a local community partner for indoor venues.	FY 2018 Q4	FY 2018 Q4

Type of Research

Applied

Technical Readiness Level

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

Transition Plans

A Department wide field-based biological assessment concept of operations and systems architecture will be developed that includes all relevant DHS components (CBP, USSS, TSA, and ICE) and stakeholders. From there, customized technology architectures suited to the individual operational environments, which may include thermal sensing, multispectral imaging, volatile organic compound detection and/or canine detection, and budgets, will be developed utilizing COTS technology where available and investing in new technology development when necessary. With new technology development, preference will be given to technologies that have commercial markets beyond component needs if at all possible, to ensure the availability of an infrastructure to maintain and improve technologies as needed.

Underground Transport Biodetection Test Bed

- **Problem:** Subway systems are attractive targets for potential acts of bioterrorism, particularly with aerosolized biological agents (e.g., Bacillus anthracis). Real-time detection of biological agents is currently not possible. An FY 2016 DHS field test in the New York City subway that simulated a biological agent release has confirmed dispersion model predictions that contamination will be widespread and a major public health crisis will occur.
- **Solution:** A permanent test bed in a major subway system will enable the evaluation of emerging bio-detection technologies, detection architectures, and mitigation strategies to limit agent transport and public exposure to an aerosolized threat. Testing of rapid detection technologies and architectures, and mitigation countermeasures is necessary to establish performance in the harsh environment of a subway and suitability for operational deployment. The Metropolitan Transportation Authority New York City Transit has expressed an interest to partner with DHS on implementing a test bed in the nation's largest subway system.
- **Impact:** A test bed in the operational environment will enable an assessment of the readiness of emerging biodetection technologies and mitigation strategies and countermeasures, with the goal to minimize the impact and consequences of a bioterrorism event in the subway. The test bed will enable subway system authorities to make informed decisions on new technology acquisition and deployment to enhance public safety and situational awareness.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Budget	-	-	-	-	5,000
Obligations	-	-	-	-	

FY 2018 Planned Key Milestone Events (Budget Year)

- Down-select candidate detection architectures and acquire initial technologies.
- Fabricate and validate test bed operational readiness.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Execute Memorandum of Agreement with subway partner	FY 2017 Q2	FY 2017 Q4
Develop initial test bed plan in collaboration with subway partner	FY 2017 Q3	FY 2017 Q4
FY 2018		
Finalize test bed plan	FY 2018 Q1	FY 2018 Q2
Acquire technologies for test bed	FY 2018 Q1	FY 2018 Q2
Test bed fabrication and certification	FY 2018 Q2	FY 2018 Q4

Type of Research
Applied

Technical Readiness Level
TRL 6-7

Transition Plans
Technologies and mitigation strategies successfully demonstrated to be effective in the subway environment will be transitioned to MTA New York City Transit and other major subway systems for active deployment.

BioInformatics for BioDefense (BioFutures)

- **Problem**: Recent advancements in the field of life sciences, particularly synthetic biology, are a potential concern to the Homeland Security Enterprise (HSE). Especially with the tremendous rate of scientific advancement in the fields of synthetic biology and genetic engineering, the DHS community as well as the commercial gene synthesis community must be kept apprised about synthetic biology and ways it may be misused.

- **Solution**: Develop knowledge products and databases that inform decision-makers about the implications of synthetic biology. Active review of developing technologies, modeling of pathogen synthesis, and improving stakeholders' understanding of the science will increase awareness as technologies and their policy and privacy implications evolve. Develop and host interactions between government, industry and academics to foster increased awareness and understanding.

- **Impact**: The BioFutures program helps generate and develop requirements for CBDs Biological Threat Characterization Program and for other biodefense efforts within the HSE. BioFutures increases the awareness and understanding of synthetic biological threats across the HSE. This project increases the probability of preventing and minimizing the negative impact of synthetic biological risks at a time of rapid technological flux.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Budget	-	-	-	-	3,000
Obligations	-	-	-	-	

Budget Year Key Events

- Develop system for ongoing monitoring and assessment of synthetic biology risks, based on risk spectrum developed by the Intelligence Advanced Research Projects Agency (IARPA).
- Transition to FBI two pathways by which synthetic organism experimentation may be conducted, with emphasis on means of alerting in case of accident or misuse.

Project Schedule Including Milestones

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Develop system for ongoing monitoring and assessment of synthetic biology risks, based on risk spectrum developed by IARPA.	FY 2018 Q4	

Type of Research

Development

Technical Readiness Level

N/A

Transition Plans

Make technical reports and databases available to users across the HSE and to appropriate commercial customers via the Bio-Defense Knowledge Center Management System.

Chemical and Biological Integrated Product Team Solutions

- **Problem**: DHS Components have the mission to protect the nation from acts of terrorism, including attacks with chemical and biological agents. Each of the components has a unique role in this mission and each has gaps in their current capabilities to prevent, protect, mitigate, respond to or recover from a chemical or biological agent attack. Operators in this mission space play a variety of roles and require detection, enhanced personal protection equipment, warning tools, modeling and predictive analytics capabilities.

- **Solution**: The Chemical Biological Integrated Product Team Solutions (CB IPT Solutions) project will interface with DHS components to develop detailed requirements and deliver technological solutions to fill capability gaps that impact diverse missions and operations in which chemical and biological agents may be encountered. Solutions will be provided based upon Component derived requirements.

- **Impact**: This program will deliver solutions to high-priority gaps identified by DHS components through the Chemical Biological IPT process.

Sub Projects

CB IPT Solutions has identified these six activities as the first gaps to be addressed:

- Gap 1: Subway systems are attractive targets for potential acts of bioterrorism, particularly with aerosolized biological agents (e.g., Bacillus anthracis). Real-time detection of biological agents is currently not possible. An FY 2016 DHS field test in the New York City subway that simulated a biological agent release has confirmed dispersion model predictions – contamination will be widespread and a major public health crisis will occur.

- Gap 2: Law Enforcement VIP Protective Personnel lack an enhanced ability to discreetly carry personal protective equipment (PPE) for the protection and safe extraction of senior leadership and other designated persons from a full range of operational environments where a hazardous biological, chemical or radiological (CBR) substance has been released. The lack of this enhanced ability prolongs exposure to a respiratory threat due to the inaccessibility of PPE in an emergency situation.

- Gap 3: The U.S. Coast Guard Maritime Security Response Teams (MSRT) are required to engage in physically-demanding tasks, including operating in a Chemical, Biological, Radiological and Nuclear environment, while conducting missions involving high-threat, non-compliant and opposed boarding operations. Such missions include prolonged operations against active aggressors in close quarters. Due to the physically-demanding nature of such missions, MSRT requires a lightweight, respiratory protective system that minimizes stress and exertion in order to enable optimal performance, while safeguarding the wearer against a range of contaminates.

- Gap 4: Releases of chemical or biological agents can affect multiple areas (or domains) such as outdoors, subways and integrated transit facilities or other interconnected infrastructure. OHA has identified a requirement to improve situational awareness and better inform detector architectures through integration of advanced modeling techniques. An integrated modeling suite that addresses all these areas is necessary to not only optimize detection resources, but also assess attribution based on real-time detection data and other available air and surface sampling data.

- Gap 5: The threat of a terrorist attack involving biological weapons within the U.S. remains a significant concern; this is particularly true for high population urban areas. To date, there is limited data validating existing threat dispersion models and a poor understanding of how complex urban airflows and fomite transfer will translate to contaminated areas and risk to populations.

- Gap 6: The safe identification of chemical threats at security checkpoints to prevent their use against the public requires the need for a state-of-the-art solution. The production of deadly chemical threat agents (CTAs) is within the capability of many state actors and unfortunately, some terrorist and/or home-grown violent extremists (HVEs). Development and demonstration of a fieldable system for chemical threat mapping to identify CTAs without opening their packaged containers thru the use of multi-modal Ultra-Low Magnetic Field Nuclear Magnetic Resonance (ULMF-NMR) signatures could detect and prevent such threats from reaching their targets.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	-	5,000
Obligations	-	-	-	-	

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Initiate GAP 1 Projects.	FY 2017 Q3	FY 2018 Q4
Initiate GAP 2 Projects.	FY 2017 Q3	FY 2018 Q4
Initiate GAP 3 Projects.	FY 2017 Q3	FY 2018 Q4
Initiate GAP 4 Projects.	FY 2017 Q4	FY 2018 Q4
Initiate GAP 5 Projects.	FY 2017 Q3	FY 2020 Q3
Initiate GAP 6 Projects.	FY 2017 Q3	FY 2020 Q3

Type of Research

Development, and Applied

Technical Readiness Level

TRL 6-7 for technologies.

Transition Plans

Technology solutions and knowledge products, developed in accord with component requirements, will be transitioned to component customers for acquisition programs or preparedness planning.

Chemical Detection – FY 2017 Annualized Continuing Resolution: $3.099 M. FY 2018 Request $0.
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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	3,099	0
Obligations	-	-	-	0	

Prior 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.

Project Schedule Including Milestones

N/A

Type of Research
Applied

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

Transition Plans
N/A

Explosives Detection – FY 2017 Annualized Continuing Resolution: $37.211M. FY 2018 Request: $31.641M. 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 16,000 detection canine teams, encompassing all threat detection disciplines and spreads across the Federal, State, local and tribal law enforcement community. There is a need for a centralized focal point within DHS to address mission requirements, conduct operationally relevant research, and act as a repository of expert advice on common problems across Government, academia and the private sector. The detection canine teams have limited access to training materials and limited time where they can train on particular materials, thus decreasing their proficiency and ability to improve detection techniques. Non-hazardous training aids will allow the teams to train more frequently, maintain a high level of proficiency, facilitate a simplified training aid storage plan, and allow for the frequent assessment of the effectiveness of current concepts of operations (CONOPS). In the explosives threat vector, the growing threat of person-borne improvised explosive devices (PBIEDs) 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 crowd public events. In another threat vector, an emerging need to determine if detection canines can be utilized in a meaningful way to detect persons with infectious diseases at U.S. border points of entry was validated in the 2016 DHS Integrated Process Team for Chemical and Biological Defense. 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 detection threat matrix would be a significant advancement and allow for improved training efficiency and detection proficiency. The lack of structured independent test and evaluation of detection canines in

their operational environment has increased uncertainty of the capability and proficiency of the detection canines throughout the HSE.

- **Solution:** Provide our customer base - TSA and the Homeland Security Enterprise (HSE) - with the tools, techniques, and knowledge to better understand, train, and utilize the detection canine, and improve proficiency of the DHS/HSE detection canine teams. Provide an enduring research and development capability to the Homeland Security Enterprise with a unique focal point and knowledge base for detection canines by establishing a scientifically rigorous, statistically significant approach for the detection canine community that is currently absent in the industry. The Program will provide regional reality-based events that will bring added value while enhancing canine teams' current capabilities. S&T will develop and test non-hazardous canine training aids to provide performance results equivalent to or better than performance on the actual threat material. 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 the inherent capabilities of laboratory and chemistry expertise established within the Program, S&T will bring scientific analysis and controlled testing of the combination of the refined 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 detection canines while dramatically reducing the resources in time and cost needed to establish and maintain a high level of proficiency. The Program will partner with the DHS S&T Chemical and Biological Defense Program to develop and transition new and novel training aids for canine detection of biological hazards, infected people or infectious cargo in multiple settings, including at the borders.

- **Impact:** This Program establishes a Research, Development, Test and Evaluation (RDT&E) focal point for the HSE detection canine community. It improves the operational proficiency of DHS' and other HSE partners' fielded teams to more efficiently and effectively train and perform in the operational environment. Development of a formal testing capability and critical need training aids will significantly improve mission performance, lower lifecycle costs and expedite training and deployment of canine teams. The Program also provides a specific focus on determining the proof of concept for operational usefulness of the Person borne Improvised Explosive Device (PBIED) detection canine to protect the soft target realm of mass transit and large crowd events. The Program is creating a validated training and maintenance methodology for PBIED canines as well as determining the operational performance measures of effectiveness for the various threat types, concealment methods, crowd sizes and other operational parameters. The program is conducting this by establishing partnerships throughout the HSE to the national infrastructure.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	4,200	4,500	4,800	5,269	4,408
Obligations	3,652	4,415	4,341	724	

FY 2016 Key Milestone Events (Prior Year)

- 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.

FY 2017 Key Milestone Events (Year of Execution)

- Deliver results of the initial phase trained odor reduction testing conducted with TSA's Canine Training Center.
- Provide the results of TSA Passenger Screening canine operational assessment.
- Conduct feasibility assessment for the development of low-cost non-hazardous training aids for selected conventional explosives.
- Conduct Phase 2 prototype testing for canine mounted track and transmit device.

FY 2018 Key Milestone Events (Budget Year)

- Finalize commercialization of the second critical need non-hazardous peroxide-based explosive Canine Training Aid for use in the HSE.
- Complete qualitative analysis of initial series of regional canine events. Analysis will inform a better understanding of operational readiness, identify gaps, provide exposure to non-hazardous peroxide based explosive odor and validate storage and handling challenges.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
The program has sponsored the development of a state of the art laboratory capability to validate the presence of explosive chemical compounds down to a canine level of detection. This is a breakthrough for the scientific community who are focused on chemical analysis for trace detection machines and not for canine detection. The Massachusetts Institute of Technology / Lincoln Laboratory (MIT / LL) has published their findings in peer reviewed publications and has received recognition from the greater community of interest.	FY 2016 Q1	FY 2016 Q4
The program has developed an inherent capability for DHS/HSE to be able to test emerging threats to aviation (PEDS) and to the HSE (e.g. Inspire Magazine, Boston Marathon, threat concealments). The program has demonstrated its ability to respond in quick fashion with over two dozen regional canine teams at the request of Federal partners, such as the FBI, when intelligence warrants a comprehensive threat assessment.	FY 2015 Q2	FY 2016 Q1
Execution of Phase 2 Parametric testing of PBIED explosive detection canines in the operational environment. Phase 2 focus is on variations of explosive placements and concealments on the body. The findings of this phase of parametric testing will be used as a baseline to build upon in future phases of test and evaluation. In the interim, these findings have value to inform concepts of operations and risk mitigation based on probabilities of detection.	FY 2016 Q4	FY 2017 Q3
FY 2017		
The program has developed an independent test and evaluation (IT&E) process that has been deemed reliable by the Government Accounting Office as a benchmark for assessment of TSA's Passenger Screening Canine Program and by adjunct the greater Homeland Security Enterprise. The program will conduct numerous assessments for TSA, at their request, including their domestic Passenger Screening Canine (PSC) Program.	FY 2017 Q2	FY 2018 Q2
Conduct qualitative assessment and analysis of law enforcement	FY 2017 Q3	FY 2019 Q4

Research & Development Description	Plan Start Date	Planned Completion
explosive detection canine teams in an operational environment through the Regional Explosives Detection Dog Initiative (REDDI). Upon recursive execution, identify strengths and weaknesses and trends that validate current S&T R&D program and inform direction of investments going forward that address community need.		
FY 2018		
Execution of Phase 3 Parametric testing of PBIED explosive detection canines in the operational environment. Phase 3 focus is on variations of environmental conditions. The findings of this phase of parametric testing will be used as a baseline to build upon in future phases of test and evaluation. In the interim, these findings have value to inform concepts of operations and risk mitigation based on probabilities of detection.	FY 2018 Q1	FY 2019 Q4

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 manufacturer.
  - 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.
  - Inform 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 inform U.S./UK sharing for recent aviation threat vector.
- Results inform 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 program 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, improved onscreen alarm resolution, lower false alarm rates (below 10 percent), and reduced lifecycle costs, allowing TSA to be more efficient and effective.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	21,700	19,400	11,069	9,000	7,000
Obligations	20,174	14,149	10,088	498	

FY 2016 Key Milestone Events (Prior Year)

- Deliver X-ray diffraction based (XRD) hold baggage screening system prototype.
- Deliver System Design Document.
- Finalize 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.

FY 2017 Key Milestone Events (Year of Execution)

- Release Amendment to Apex Screening at Speed Broad Agency Announcement to include Advanced X-ray Systems Development Technical Topic Areas.
- Award a minimum of two contracts at Transition Readiness Level 5-7.
- Transition one Next Gen Checked Baggage solution (TRL 6-7) to either Systems development or to TSA OSC/OSO (FY 2016).
- Deliver one advanced algorithm for existing Explosives Detection System (EDS) or Advanced Technology (AT) systems.
- Develop a functional and testable X-ray diffraction explosive detection system suitable for acquiring data at government test facilities.
- Demonstrate enhanced materials discrimination using technologies developed under Broad Agency Announcement 13-05 projects.

FY 2018 Key Milestone Events (Budget Year)

- Award up to three contracts developing advanced X-ray architecture, algorithms, and components on the Broad Agency Announcement.
- Conduct system concept review.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Next Generation X ray Diffraction Imaging.	FY 2016 Q4	FY 2017 Q2
HALO X-Ray Imaging PhaseII (build pre-prototype EDS system based on Phase I design, modeling, and architecture).	FY 2016 Q4	FY 2017 Q3
Advanced Material Discrimination X-ray Architectural Design Concepts Phase II.	FY 2016 Q4	FY 2017 Q3
FY 2017		
Advanced X-ray Systems Development Phase I Awards - Intial awards for BAA 17-03 phased in order to determine abiliity for prototype development at TRL 4 and progression to TRL 6-7 in a 24 month period. This will include preliminary and critical design reviews.	FY 2017 Q2	FY 2018 Q2
FY 2018		
Advanced X-ray Systems Development Phase I Awards - Remaining awards for BAA 17-03, phased in order to determine abiliity for prototype development at TRL 4 and progression to TRL 6-7 in a 24 month period. This will include preliminary and critical design reviews Number of awards will be reduced from eight to three.	FY 2018 Q3	FY 2019 Q2
Conduct system concetp reivew.	FY 2018 Q1	FY 2018 Q3

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.
- Development spirals will be coordinated with TSA's recapitalization plans ensuring smooth and timely technology insertion.

Primary Screening for Passengers

- **Problem:** Current people screening technology is not fast enough nor does it automatically detect all of the threats that operational components require. 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:** This Program will 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. Novel approaches to solving these problems include a Prize Competition to develop improved algorithms for an S&T-developed next-generation AIT. New capabilities under development for AIT systems include the ability to screen passengers while they walk, the ability to screen through bulky outerwear and shoes, and alternative frequency bands that acquire depth information to better image in three dimensions. Such approaches will provide higher screening throughput, improved imaging resolution, and richer signatures that enable detection at TSA's highest tier (i.e., can detect more challenging threats). 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 whether suspect items are potentially harmful or benign, reducing the rate of pat-downs and other intrusive security measures.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	9,957	6,000
Obligations	-	-	-	2,122	

FY 2017 Key Milestone Events (Year of Execution)

- Conduct Preliminary Design Reviews for systems selected for development for high-throughput screening at TSA's highest security standards.
- Demonstrate alpha prototype for stand-off passenger screening with reduced divestiture of clothing. Complete at least two Preliminary Design Reviews for systems selected for development for high-throughput screening at TSA's highest tier security standards.

FY 2018 Key Milestone Events (Budget Year)

- Receive a laboratory prototype for a walking-speed passenger screening system with reduced passenger divestiture requirements.
- AIT Algorithm Prize Competition Review and Award.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Person Screening Technology method alternative analysis	FY 2016 Q4	FY 2017 Q4
Person Screening Technology prototype requirements	FY 2016 Q4	FY 2017 Q3
FY 2017		
Preliminary Design Review for Passenger Screening	FY 2017 Q1	FY 2017Q1
Person Screening Technology laboratory prototype development	FY 2017 Q4	FY 2018 Q4
AIT Algorithm Prize Competition planning	FY 2017 Q1	FY 2017 Q2

AIT Algorithm Prize Competition development time	FY 2017 Q2	FY 2018 Q1
Complete Analysis of Alternatives for System Architecture	FY 2017 Q4	FY 2017Q4
FY 2018		
AIT Algorithm Prize Competition Review and Award	FY 2018 Q1	FY 2018 Q1

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 Baggage

- **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 baggage screening technologies to improve detection capability and increase passenger throughput, while maintaining or improving life cycle costs which is complementary to the Apex Screening at Speed program. Specifically, this project will deliver carry-on baggage screening systems with Automated Target Recognition (ATR) for both explosives and other prohibited items. Technologies under development include X-ray systems that incorporate X-ray diffraction computed tomography, and/or energy-resolved detectors for enhanced material discrimination. These enhancements are critical to develop hardware and software that more effectively screens carry-on baggage that includes commonly carried items such as bottles and personal electronic devices, without the need to remove them from baggage. 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. Primary Screening for Carry-On Baggage will seek novel technologies and techniques complementary to other explosives detection efforts, most notably Primary Screening for Passengers, Apex Screening at Speed, and Secondary Screening Technology Development.

- **Impact:** Improved carry-on baggage screening technologies 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 prohibited items in carry-on baggage 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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	6,609	4,000
Obligations	-	-	-	0	

FY 2017 Key Milestone Events (Year of Execution)

- Complete at least two Preliminary Design Reviews for systems selected for development for high-throughput screening at TSA's highest tier security standards.

FY 2018 Key Milestone Events (Budget Year)

- Deliver X-ray diffraction (XRD) system prototype for carry-on baggage screening to discriminate threats among various liquids, gels, and aerosols.
- Test and evaluation of novel X-Ray diffraction screening system.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Design and review of novel phase contrast screening system.	FY 2017 Q1	FY 2017 Q3
FY 2018		
Test and evaluation of novel X-Ray diffraction screening system.	FY 2017 Q3	FY 2018 Q2
Phase contrast data collection on threats and simulants.	FY 2017 Q4	FY 2018 Q1
Analyze and report phase contrast data. Refine X-ray diffraction prototype design.	FY 2018 Q1	FY 2018 Q3

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.

Training and Performance Optimization (formerly Screening Training and Selection)

- **Problem:** The efficiency and effectiveness of first responders and those on the front lines of national security is directly related to the preparedness and robustness, capacity for rapid recovery, and adaptability achieved in training. Improved training, including associated materials, methods and tools and technologies lead to increased operational capabilities in the field and results in more efficient and effective DHS end users, federal, state and local stakeholders and the general public, when responding to local, national or international disasters or emergencies.

- **Solution:** S&T will work across DHS components and the first responder community to identify common capability gaps and operational needs that can be addressed through improved training methods, tools and technologies. These DHS end users and

first responders require training that leverages the latest cutting edge training methods and innovative technologies to ensure their skills are flexible to respond under a variety of conditions, thereby making them more prepared and resilient, and increasing national security. Improved training in areas such as the underlying components of decision making (e.g., perceptual skills, critical thinking, alternate option weighing) are critical, particularly when such critical decision making is required under uncertainty within a time-constrained or hazardous environment. Improving training and optimizing the performance of first responders and those on the front lines of national security technologies will include maximizing human performance as well optimizing the integration of humans with the systems they use, whereby the collective synergy will be optimized to improve operational efficiency, effectiveness and overall national security.

- **Impact:** Providing DHS Enterprise end users and first responders with improved training methods, technologies and tools will result in operational performance increases in those individuals and an increase in national security. More effective and efficient training improves performance and is directly correlated to increased preparedness, robustness, capacity for rapid recovery, and adaptability.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	501	500	500	1,033	1,033
Obligations	460	461	418	0	

FY 2016 Key Milestone Events (Prior Year)

- N/A

FY 2017 Key Milestone Events (Year of Execution)

- N/A

FY 2018 Key Milestone Events (Budget Year)

- Conduct study to determine the pressure and patterns involved in law enforcement pat down procedures. Create new prototype pat down suits that can be transitioned for a training effectiveness evaluation.
- Conduct at least two Training Effectiveness Evaluations (TEEs) at locations TBD for wearable pat down training prototypes.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Development of prototype mannequins for PATT-M and PATT-F.	FY 2017 Q1	FY 2017 Q4
Fully Integrated Unit with Physical Characteristics and Software.	FY 2017 Q1	FY 2017 Q4
Implementation and Transition Plan development.	FY 2017 Q1	FY 2018 Q1
Training Effectiveness Evaluation of PATT-M and PATT-F.	FY 2017 Q4	FY 2018 Q1

Type of Research
Basic

Technical Readiness Level
TRL 4

Transition Plans
8 PATT-M and 8 PATT-F systems will transition to TSA Office of Security Capabilities (OSC), Office of Training and Workforce Engagement (OTWE), and Office of Security Operations (OSC) at TSA Headquarters.

Secondary Screening Technology Development

- **Problem:** DHS components (i.e., TSA, USSS, CBP, and U.S. Coast Guard) use Explosives Trace Detectors (ETDs) as a screening tool for detection of explosives. The 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, the Secondary Screening Technology Development program develops Next Generation (Next Gen) ETDs with more easily upgradable and expandable threat library that can selectively identify current and emerging explosives. New capabilities are sought with smaller, more portable ETDs while keeping costs as low as possible. Concurrently, the Program seeks to increase ETD sensitivity by developing novel sampling technologies with higher collection efficiency and training tools to help increase TSOs explosives sampling proficiency.

- **Impact:** Novel detection capabilities and improved sampling technologies and methods enable ETD operators to optimize ETDs for detecting current and future explosive threats. Short-term impact includes developing Advanced Itemiser DX retrofit kits that provide ETD operators with improved explosives detection capability and provide TSA with an option to retrofit currently deployed ETDs. For mid- and long-term impact, Next Gen ETDs, in combination with enhanced sampling technologies, will provide TSA and other DHS components with the 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. In addition, the Program's Supporting Sciences effort is developing knowledge products and test and evaluation tools for supporting TSA's interest in developing non-contact explosives vapor/particulate detection standards.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	5,343	5,200
Obligations	-	-	-	719	

FY 2017 Key Milestone Events (Year of Execution)

- Demonstrate a prototype's ability to produce three-dimensional transmission, diffraction, phase and/or dark-field X-ray data useful for security screening.
- Test and develop a retrofit (ETD kit for enhanced explosives detection)
- Conduct Developmental Test and Evaluation of High Performance Ion Mobility Spectrometry - Mass Spectrometry ETD prototypes.
- Conduct Developmental Test and Evaluation of Triple Quadrupole Mass Spectrometry ETD.
- Conduct Critical Design Review of an ETD with integrated non-contact sampler.
- Conduct quarterly meetings of Working Group for Sample Preparation Standards and Methods for operationally relevant testing of screeners for residual explosives using optical detection.

FY 2018 Key Milestone Events (Budget Year)

- Conduct Critical Design Review of a High Throughput In-Line ETD Screener for checked baggage.
- Conduct Developmental Test and Evaluation at TSL of Non-contact High Volume Vapor and Particle Sampler prototypes.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
DT&E of three retrofit ETD kits. This DT&E was conducted in collaboration with DHS Transportation Security Lab. The prototypes were tested and evaluated on their detection capabilities against conventional and homemade explosives. DT&E testing showed the temperature-ramping thermal desorber in this Adv IT-DX retrofit provided an expanded threat library capability.	FY 2016 Q4	FY 2017 Q1
DT&E of IMS–MS ETDs. This DT&E will be conducted in collaboration with DHS Transportation Security Lab. The prototypes are tested and evaluated on their detection capabilities against conventional and homemade explosives. Special emphasis is placed on the IMS' ability to detect and route analytes of interest to the Mass Spec and the Mass Spec engine's ability to confirm identities of conventional and homemade explosives**.**	FY 2017 Q3	FY 2017 Q3
FY 2018		
Critical Design Review (CDR) of an integrated Non-particle Vapor Sampler. This CDR will focus on evaluating detailed design of the non-contact sampler including hardware and software, explosives detection performance, and systems tradeoffs and rationales. The CDR will focus on whether non-contact samplers can enhance explosives sampling efficiency and extend Concepts of Operations (CONOPs) for Transportation Security Officers.	FY 2017 Q4	FY 2018 Q1
DT&E of Triple Quad MS ETDs. This DT&E will be conducted in collaboration with DHS Transportation Security Lab. The prototypes are tested and evaluated on their detection capabilities against conventional and homemade explosives. Special emphasis is placed on the Mass Spec engine's ability to confirm identities of conventional and homemade explosives.	FY 2017 Q4	FY 2018 Q1
DT&E of Non-contact High Volume Vapor and Particle Sampler. This DT&E will be conducted in collaboration with DHS Transportation Security Lab. The prototypes are tested and evaluated on their detection capabilities against conventional and homemade explosives and their throughput of screening passengers and carry-on bags at checkpoints.	FY 2017 Q4	FY 2018 Q3

Type of Research
Applied

Technical Readiness Level
The program plans to begin at TRL 3 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 ETD prototypes. Pending successful development of the ETD prototypes, the Secondary Screening Technology Development is working to develop Transition Plans with these representatives. With regard to the Advanced Itemiser DX ETD retrofit project, the Program Manager is in the process of coordinating with the TSA Office of Requirements and Capabilities Analysis (ORCA) and TSA Office of Acquisition Program Management (OAPM) to debrief them on the potential of this new capability.

Surface Transportation Explosive Threat Detection (STETD) Program

- **Problem:** Current security capabilities for screening people and baggage in surface transportation environments are extremely limited. The unique requirements of the surface transportation end-user community drives the need for an open system with no fixed checkpoints, extremely high throughput, and an unalterable existing infrastructure within which technologies for explosives detection must fit. Developing these capabilities necessitates a dedicated program to address vulnerabilities to terrorist attack.

- **Solution:** Develop intelligent video capabilities to automatically detect and rapidly assess leave behind packages, continue the evaluation of advanced security technologies for surface transportation applications, provide the surface transportation end-user community with a layered and integrated capability to detect and mitigate explosive threats, develop a system capable of detecting Person-borne (PB) and Leave-behind (LB) Improvised Explosive Devices (IED) in a surface transportation environment during rush hour without impeding passenger throughput, and develop high throughput/high-speed anomaly detection technologies [Active millimeter wave (mmW), intelligent video (IV) algorithm, etc.] to provide rapid screening of passengers.

- **Impact:** The program will develop next generation security technology to screen people for threats in the high-throughput environment of surface transportation systems. The program will also deliver assessments of COTS/near-COTS and emerging "state-of-the-art" technologies that have potential to address security vulnerabilities within the surface transportation environment. The result will address a vulnerability by providing affordable solutions for mitigating the explosive threat for the surface transportation end-user community.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	-	4,000
Obligations	-	-	-	-	

FY 2018 Planned Key Milestone Events (Budget Year)

- Conduct lab testing of prototype mmW imager to gauge effectiveness of preliminary integration of image exploitation algorithms for automatic target recognition.
- Conduct DT&E of mmW Flat Panel Imaging Array technology in simulated operational environment to determine limits of detection performance in operational environment and impact to end-user.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Integrate IV algorithm into FOVEA tool suite demonstrating automated detection and end-user cueing.	FY 2018 Q1	FY 2018 Q2
Development of non-divested image exploitation algorithm and integration with prototype mmW imager to scan traveling public and their belongings without slowing throughput.	FY 2018 Q1	FY 2018 Q3
Conduct simulation and analysis of layered sensing configurations for layered architecture prototyping effort to optimize sensor placement and system performance.	FY 2018 Q2	FY 2018 Q4

Type of Research
Developmental

Technical Readiness Level
Project begins at TRL5 and ends at TRL7.

Transition Plans
DT&E and OT&E will be conducted with surface transportation end-users within TSA OCRA Mass Transit Test Beds. When technologies reach appropriate maturity, they will be added to the approved grant list for purchase by surface transportation authorities.

5. Counter Terrorist – FY 2017 Annualized Continuing Resolution: $99.506M. FY 2018 Request: $81.051M. S&T 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.

Bioagent Threat Assessment – FY 2017 Annualized Continuing Resolution: $23.628M. FY 2018 Request: $16.369M. This program addresses biological 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 agent.

Biological Terrorism Risk Assessment (BTRA)

- **Problem:** The Homeland Security Enterprise (HSE) needs to prevent, protect, mitigate, respond and recover from biological terrorism with limited resources. Homeland Security Presidential Directive 10 (HSPD-10) outlines the need for the comprehensive analysis of our nation's biothreat defenses to help inform investments for national strategic biodefense planning, while identifying key knowledge and capability gaps and also evaluating critical vulnerability mitigation strategies.

- **Solution:** The BTRA program produces periodic risk assessments that estimate terrorism risk as the probability of an attack occurring, and the consequences of an attack, should it occur. It incorporates 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. This project responds to the needs of interagency partners by enhancing reliance on national strategic guidance to frame the problem space; redesign the analytic process to ensure maximal partner input; and refining, updating, and validating BTRA models. A variety of rapid analysis tools are being developed to allow users to explore a variety of CONOPS and make judgments for scenarios that merit further investment to reduce risk.

- **Impact:** The BTRA informs decision-making and shapes resource allocations across HSE. The BTRA program provides data, models, tools, and analyses to evaluate and compare the potential benefits of various strategies across the biodefense solution space, and provides decision support to guide investments that lower risk of a bioterrorist attack.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	4,072	3,800	2,000	2,000	2,000
Obligations	3,468	2,882	1,670	233	

FY 2016 Key Milestone Events (Prior Year)

- CAPT-Bio V 1.0 was released, and transitioned to Joint Task Force Civil Support to help them develop their planning exercises
- CBRN Economic Consequence Model development was initiated to improve the economic consequence estimates for the TRAs.

FY 2017 Key Milestone Events (Year of Execution)

- Completion of the economic consequence model, and integration into BTRA results. A BTRA 5.1 analysis will be completed that estimates economic consequences of all attack scenarios.
- Development of an interactive Content Management System (CMS) to provide a central information hub on Homeland Secure Data Network (HSDN) and Joint Worldwide Intelligence Communications Systems (JWICS).

FY 2018 Key Milestone Events (Budget Year)

- Incorporate the economic consequence model into the BTRA analyses.
- Create a Content Management System (CMS) for interactive operability with end-users

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
BTRA 5.0 Draft Results Review	FY 2016 Q3	FY 2016 Q3
FY 2017		
BTRA 5.0 Final Report	FY 2017 Q1	FY 2017 Q2
BTRA 5.0 Tailored Assessments	FY 2017 Q3	FY 2017 Q3
BTRA 6.0 Initiation	FY 2017 Q2	FY 2017 Q3
BTRA 6.0 Data Review	FY 2017 Q4	FY 2018 Q1
BTRA 6.0 Model Review	FY 2017 Q4	FY 2018 Q1
FY 2018		
BTRA 6.0 Intelligence Survey	FY 2018 Q1	FY 2018 Q4
BTRA 6.0 Draft Results Review	FY 2018 Q3	FY 2018 Q3

Type of Research

Development

Technical Readiness Level
N/A: Periodic delivery of Knowledge Products.

Transition Plans
The BTRA tools and products will be transitioned to stakeholders and customers with DHS and across the interagency, as requested. The tools to be transitioned will be:

- Risk Visualization Tool (RiViT)
- Biological Countermeasure Analysis and Planning Tool (Bio CAPT)
- Content Management System (CMS)

The products to be transitioned will be:

- Pre-harvest agro-terrorism risk model report, data, and results of analyses
- Subway 2.0 Model Report
- Economic 2.0 model report
- UAV Model Report
- BTRA 5.1
- BTRA 6.0

Biodefense Knowledge Center (BKC)

- **Problem:** Customers from around the HSE require vetted information, knowledge and expertise to help them make decisions that involve biological sciences and biological threats. HSE customers' information and decision needs vary considerably across DHS Components, multiple Federal, State, and local agencies.

- **Solution:** The Biodefense Knowledge Center is an enduring DHS center of expertise, with knowledge products that bridge science, technology, intelligence, health threats, and law enforcement. BKC provides customer requested biothreat and bioscience assessments as well as in-depth analyses of biodefense issues and biotechnologies. Its key assessments and analytical products include: in-depth analyses of genomic and advanced biothreats; biological threat agent fact books; a knowledge management system available at multiple levels of classification, which extracts, hosts and analyzes information for multiple Federal, State, and local users.

- **Impact:** The Biodefense Knowledge Center increases the awareness and understanding of biological threats across the HSE at multiple levels of classification. This project increases the probability of preventing and minimizing the impact of biological

threat attacks. The BKC helps generate and develop requirements for CBD's Biological Threat Characterization Program and for other biodefense efforts within the homeland security enterprise.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	6,000	4,500	3,000	3,000	3,000
Obligations	6,070	4,605	5,092	0	

Prior Year Key Events

- Published final MTA 2.0 (Ba) – 720 agent use scenarios; intelligence elicitation and overlay; main report plus seven appendices; multi-venue exposure modeling (indoor, outdoor, subway).
- Published survey of mission-relevant unmanned aerial vehicles in support of USG characterization and research initiatives.
- Hosted Sequences of Interest database in the Biodefense Knowledge Management System (BKMS).
- Deployed chem-bio digital forensics capabilities at two DHS Fusion Centers in California.

Current Year Key Events

- Deploy pathogen genomic alignment toolset and metadata analysis capability for the DHS Sequences of Interest database.
- Complete two in-depth technical analyses of biothreat capability pathways for biodefense community.
- Integrate >300M genomic records, 50M biodefense-related genomic reports, >2M full-text scientific articles and >750K new reports per quarter from >15 interagency data sources for biodefense community analysis on unclassified and classified BKMS networks.

Budget Year Key Events

- Develop novel genomic analysis capabilities for biothreat pathways identified previous year.
- Deploy advanced biothreat pathway visualization capabilities and dynamic tracking for emerging biotechnologies and impact of scientific information.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Expand use of BKMS as trusted third party review of government biothreat research programs within and outside DHS.	FY 2017 Q1	FY 2017 Q4
Update scientific and sensitive holdings in the Biodefense Knowledge Management System for the biodefense community.	FY 2017 Q1	FY 2017 Q4
Host databases and tools relevant to understanding and preventing biothreats in the genomic age	FY 2017 Q1	FY 2017 Q4
Collaborate with FBI on instantiation of digital forensics capability	FY 2017 Q1	FY 2017 Q2
Maintain BKMS and GKC to support Chem Bio Defense, as well as stakeholder requests and reach back support	FY 2017 Q1	FY 2017 Q4

Type of Research
Development

Technical Readiness Level
N/A

Transition Plans
Make technical reports available to users across the Homeland Security Enterprise via the Biodefense Knowledge Management System.

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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	14,000	11,400	18,400	16,628	9,369
Obligations	13,953	10,498	23,513	11,663	

FY 2016 Key Milestone Events (Prior Year)

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

FY 2017 Key Milestone Events (Year of Execution)

- 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.

FY 2018 Key Milestone Events (Budget Year)

- Provide flexible and agile Biological Threat Characterization capabilities to execute national security priority initiatives in

support of DHS and the HSE that provide timely and high quality data on the characteristics of biological threat agents and technologies to support informed policy and decision-making before, during, and in response to a biological incident.

- Produce and deliver knowledge products addressing high priority knowledge gaps along the attack pathway (i.e., agent acquisition, production and processing, storage stability, dissemination, persistence, and infection/intoxication, disease and treatment in appropriate models) for biological agents to inform and improve DHS and national consequence and risk assessment efforts (e.g., the DHS Biological Terrorism Risk Assessment), DHS and HSE biodefense strategy and policy development

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
NBACC Annual Plan review	FY 2016 Q1	FY 2016 Q2
NBACC Annual Plan execution	FY 201 6Q2	FY 2017 Q2
NBACC Final Reports	FY 2017 Q2	FY 2017 Q3
BTCP Projects execution	FY 2016 Q1	FY 2016 Q4
BTCP Projects next year planning	FY 2016 Q3	FY 2016 Q4
BTCP Projects review final reports	FY 2016 Q4	FY 2017 Q1
BTCP Yearly Project (portfolio) Review	FY 2016 Q3	FY 2016 Q4
FY 2017		
NBACC Annual Plan review	FY 2017 Q1	FY 2017 Q2
NBACC Annual Plan execution	FY 2017 Q2	FY 2018 Q2
NBACC Final Reports	FY 2018 Q2	FY 2018 Q3
BTCP Projects execution	FY 2017 Q1	FY 2017 Q4
BTCP Projects next year planning	FY 2017 Q3	FY 2017 Q4
BTCP Projects review final reports	FY 2017 Q4	FY 2018 Q1
BTCP IPT Projects execution	FY 2017 Q1	FY 2017 Q4

Research & Development Description	Plan Start Date	Planned Completion
BTCP IPT Projects next year planning	FY 2017 Q3	FY 2017 Q4
BTCP IPT Projects review final reports	FY 2017 Q4	FY 2018 Q1
BTCP Yearly Project (portfolio) Review	FY 2017 Q3	FY 2017 Q4
FY 2018		
BTCP Projects execution	FY 2018 Q1	FY 2018 Q4
BTCP Projects next year planning	FY 2018 Q3	FY 2018 Q4
BTCP Projects review final reports	FY 2018 Q4	FY 2019 Q1
BTCP IPT Projects execution	FY 2018 Q1	FY 2018 Q4
BTCP IPT Projects next year planning	FY 2018 Q3	FY 2018 Q4
BTCP IPT Projects review final reports	FY 2018 Q4	FY 2019 Q1
BTCP Yearly Project (portfolio) Review	FY 2018 Q3	FY 2018 Q4

Type of Research

Applied

Technical Readiness Level

N/A: Enduring capability that results in periodic delivery of Knowledge Products.

Transition Plans

BTC regularly delivers/transitions the knowledge and insight produced through laboratory studies through reports delivered to the DHS/S&T Bioterrorism Risk Assessment, and shared with the HSE, including the Intelligence Community and the Department of Defense through the Biodefense Knowledge Management System (BKMS) and other information portals. These reports and knowledge products provide the essential technical foundation for confidence in both DHS and national consequence and risk assessments, enable policymakers to establish technically informed and sound policy, and enable decision makers to appropriately prioritize biodefense spending on medical and non-medical countermeasure acquisition programs that cost the Government billions of dollars.

Integrated CBRN Terrorism Risk Assessment (ITRA)

- **Problem:** The HSE has a need to effectively manage and administer limited resources that contribute to U.S. national preparedness for the risks of Chemical, Biological, Radiological, and Nuclear (CBRN) terrorism. In order to fulfill this mission, decision-makers require information related to potential threats and risks posed by CBRN terrorism.

- **Solution:** Homeland Security Presidential Directive 18 (HSPD-18) directs the S&T Directorate to prepare an Integrated Chemical, Biological, Radiological, and Nuclear Terrorism Risk Assessment (ITRA) on a biennial basis to provide decision-makers with information on the relative risks associated with all-CBRN terrorism. The ITRA program addresses this requirement through the consolidation and integration of the S&T Directorate's standalone risk assessments, namely, the Chemical Terrorism Risk Assessment (CTRA), Biological Terrorism Risk Assessment (BTRA), and Radiological/Nuclear Terrorism Risk Assessment (RNTRA). As a consolidation of the full spectrum of CBRN risks, the ITRA is uniquely positioned to provide information on the most efficient and cost-effective prevention, preparation and mitigation options across the Homeland Security Enterprise.

- **Impact:** The ITRA program improves senior government leadership decision-making by providing risk information and decision support tools to guide and prioritize resource allocation and investments that lower the risks of CBRN terrorism. More specifically, the ITRA program generates data, models, tools, and analyses that allow decision-makers to evaluate and compare the potential benefits of risk mitigation strategies that have tangible strategic, operational, and tactical impact across the CBRN defense solution space.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	3,800	3,800	2,000	2,000	2,000
Obligations	3,549	3,219	2,450	0	

FY 2016 Key Milestone Events (Prior Year)

- Delivered the CBRN Risk Visualization Tool (RiViT).
- Complete and deliver the Final ITRA 3.0 Report.

FY 2017 Key Milestone Events (Year of Execution)

- Deliver first iteration of the Mitigation Optimization Net Assessment (MONA) methodology. MONA will increase the utility and function of the ITRA results by serving as the foundation for delivering risk-mitigation planning tools for end users.

- Update Adversary Decision Model (ADM) by developing Adversary Capabilities Levels (ACLs). The ACLs are a list of attributes that are used to describe an adversary type or class. These attributes will then be populated with data to be used by the ADM to determine the choices an adversary is likely to make.

FY 2018 Key Milestone Events (Budget Year)

- Deliver ITRA 4.0 Final Report, a reference of the chemical, biological and radiological terrorism threat for the federal government and homeland security enterprise.
- Develop the CBRN Longitudinal Investment Strategy Analytics (LISA) tool. Based on the MONA methodology, this tool will support decision makers by providing program analyses that determines the amount of risk each program could potentially buy down, and to optimize investment portfolios for maximum ROI and risk reduction.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
ITRA 4.0 Initiation	FY 2016 Q2	FY 2016 Q3
FY 2017		
ITRA 4.0 Data Review	FY 2017 Q1	FY 2017 Q2
ITRA 4.0 Model Review	FY 2017 Q2	FY 2017 Q3
ITRA 4.0 Intelligence Survey	FY 2017 Q2	FY 2017 Q3
ITRA 4.0 Draft Results Review	FY 2017 Q4	FY 2018 Q1
FY 2018		
ITRA 4.0 Final Report	FY 2018 Q1	FY 2018 Q1
ITRA 4.0 Tailored Assessments	FY 2018 Q3	FY 2018 Q4
ITRA 5.0 Initiation	FY 2018 Q2	FY 2018 Q3
Adversary Capability Levels/Adversary Decision Model Update	FY 2017 Q2	FY 2018 Q1
MONA Methodology to Determine Addressable Risk of Programs	FY 2016 Q3	FY 2017 Q4

Research & Development Description	Plan Start Date	Planned Completion
LISA Risk Mitigation Planning Tool	FY 2018 Q1	FY 2019 Q2

Type of Research
Development

Technical Readiness Level
N/A: Periodic delivery of Knowledge Products.

Transition Plans
The ITRA tools will be transitioned to stakeholders. The tools to be transitioned will be:

- Risk Visualization Tool (RiViT)
- Biological Countermeasure Analysis and Planning Tool(Bio CAPT)
- Content Management System (CMS)
- Longitudinal Investment Strategy Analytics (LISA)

The products to be transitioned will be:

- Mitigation Optimization Net Assessment (MONA)
- ITRA 4.0
- ITRA 5.0
- Adversary Decision Model Report

Chemical Threat Assessment – FY 2017 Annualized CR: $16.463M. FY 2018 Request: $0. 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 capability to identify and assess chemical threats and vulnerabilities in the United States and develop the best responses to potential chemical hazards. Included is a single centralized repository of chemical threat

information (hazard and characterization data) for analysis of the nation's vulnerabilities to chemical events to serve key customers.

- **Solution:** The Chemical Security Analysis Center (CSAC) conducts key analytical assessments, including the Chemical Terrorism Risk Assessment (CTRA), hazard assessments and Material Threat Assessments (MTAs). In addition, CSAC develops cheminformatics tool capabilities for acquiring, storing, indexing, evaluating and making strategically available cheminformatic data, technical reports and other threat and risk knowledge products. Products include, the chemical agent reactions database (CARD), and several other user-specific electronic libraries. In FY 2017, CSAC will deliver CTRA 4.0, complete the analysis of the Jack Rabbit II chlorine releases, measure sensory threshold values of toxic chemicals, and initiate a new effort to focus on comprehensive chemical surveillance and response.

- **Impact:** CSAC serves key customers such as NPPD, USSS, 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 or chemical terrorism event in the U.S.

Funding for CSAC will be eliminated in FY 2018 to allow S&T to focus on Administration and DHS priorities. One statutorily required element, the Chemical Terrorism Risk Assessment (CTRA) task will be combined with the Integrated Terrorism Risk Assessment (ITRA) program.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	7,000	7,000	6,300	5,593	0
Obligations	7,569	6,747	6,142	0	

FY 2016 Key Milestone Events (Prior Year)

- Completed Chemical Terrorism Risk Assessment (CTRA) tailored assessments in support of USSS, NPPD, OHA, and other stakeholders within the HS enterprise.
- Delivered 2 hazard assessments or material threat assessments based on customer/stakeholder requirements.
- Delivered 5 chemical bulletins.
- Delivered updated human toxicity estimates for a select number of high risk toxic chemical threat materials.
- Completed all chlorine testing with larger quantity releases (phase II) of Jack Rabbit II.

FY 2017 Key Milestone Events (Year of Execution)

- Deliver an MTA on pharmaceutical based agents.
- Complete and deliver 2 tailored/targeted risk based analyses.
- Deliver the Chemical Terrorism Risk Assessment v4.0.
- Complete data analysis of Jack Rabbit II series of chlorine tests.
- Complete one hazard assessment on toxic chemical threats.
- Initiate system study on comprehensive chemical surveillance and response. Form stakeholder group to perform a systematic search of current CONOPs related to chemical detection and identify gaps for chemical surveillance and response.

FY 2018 Key Milestone Events (Budget Year)

- N/A

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
CTRA	FY 2017 Q2	FY 2018 Q4
Jack Rabbit II	FY 2017 Q2	FY 2018 Q3
Organoleptics for food security	FY 2017 Q2	FY 2018 Q1
Hazard Analysis	FY 2017 Q2	FY 2018 Q2
Cheminformatics	FY 2017 Q2	FY 2018 Q2

Type of Research

Applied

Technical Readiness Level

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

Transition Plans

Funding for CSAC will be eliminated in FY18, final reports for work initiated in FY17 as described in the Milestones will be delivered by the end of 2Q FY18.

A. **Explosives Threat Assessment**- FY 2017 Annualized Continuing Resolution: $11.100M. FY 2018 Request: $18.200M. 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 baggage, 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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	1,750	1,750	1,750	2,550	6,200
Obligations	1.608	1,611	1,544	2,302	

FY 2016 Key Milestone Events (Prior Year)

- 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.

FY 2017 Key Milestone Events (Year of Execution)

- 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.
- Deliver to TSA sponsors an updated classified commercial aircraft vulnerability analysis summary report, based on recently collected narrow and wide-body aircraft vulnerability live fire test data.
- Provide TSA with the results of live fire testing and analysis conducted to confirm continued effectiveness of Modified Least Risk Bomb Location Procedures (M-LRBL) in anticipation of air carrier future operational changes (e.g. phase out of removable passenger seat cushions).

FY 2018 Key Milestone Events (Budget Year)

- Conduct preliminary (unpressurized and pressurized) explosive vulnerability testing on Boeing 757 narrow body commercial aircraft test asset and deliver report.
- Conduct testing to evaluate aircraft cabin pressurization effects on curved/complex composite panel designs subjected to internal blast loads and report results to TSA.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Completed design, fabrication, and explosive testing of explosive Threat Mitigation Unit (TMU) for DHS Component customer.	FY 2015 Q1	FY 2016 Q3
Completed fabrication and delivery of 2 TMU prototype(s) to DHS Component customer for use in operational pilot testing.	FY 2016 Q3	FY 2016 Q4
Completed wide body aircraft passenger cabin threats pressurized explosive vulnerability testing (multiple B767 tests/test series) and delivered reports	FY 2015 Q1	FY 2016 Q4
Delivered updated (incorporating TSA requested user feedback updates) DHS SharePoint-based Explosive Testing Database (ETDB) to TSA.	FY 2016 Q2	FY 2016 Q4
Completed follow-on explosive vulnerability testing on primary structure composites (curved, non-reinforced test panels) used in new commercial aircraft designs (e.g., B787, A380, A350) and delivered initial report on IED blast effects on commercial aircraft composite design vulnerability.	FY 2015 Q3	FY 2016 Q4
FY 2017		
Conduct live fire explosive testing on TSA specified Modified Least Risk Bomb Location Procedures (M-LRBL) to confirm the procedures continued effectivness in light of future airline/airframe mfg. operational and design changes.	FY 2017 Q1	FY 2017 Q4
Update classified wide and narrow body commercial aircraft explosive vulnerability analysis report and deliver to TSA.	FY 2017 Q1	FY 2017 Q3
Evaluate blast effects of improvised explosive charges on curved composite aircraft panel designs (both non-refinforced and reinforced panel designs) and report.	FY 2016 Q4	FY 2017 Q3
FY 2018		
Conduct and document (test plans and test reports) preliminary narrow body aircraft (B757) live fire explosive vulnerability testing (multiple tests with both pressurized and unpressurized conditions).	FY 2017 Q4	FY 2018 Q3
Conduct live fire explosive vulnerability tests (multiple tests) on composite-construction commercial aircraft fusleage panels incorporating aircraft fuselage pressure differential. effects.	FY 2017 Q4	FY 2018 Q4
Deliver DHS-SharePoint resident updated (e.g.; incorporates user feedback and test reports/data updates) Explosive Test Database to TSA user community (TSA Explosive Specialsts).	FY 2018 Q1	FY 2018 Q3

Type of Research
Developmental

Technical Readiness Level
Completion of HULD technology at TRL7.
Completion of TMU technology development at TRL7.

Transition Plans

- Planned Demos & Deliverables/Transitions
  - Deliverable of preliminary blast testing of composite aircraft panels.
  - Deliverable of reduced weight/cost, airworthiness certified HULD design.
  - Demo – Explosive testing of explosive TMU.
  - Deliverable of multiple (2) full-scale TMU's (and associated TMU design package) to DHS Component customer for operational testing.
  - Demo – Modified Least Risk Bomb Location Procedures.
  - 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., Least Risk Bomb Location Procedures).
  - Prototype explosive TMU finalized design and full-scale prototype(s) for DHS Component customer 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 program provides capabilities for improved prevention, detection, analysis, and decision support for homeland security operations. This program will provide HME signature data for vendor development of HME detection, threat validation data, and tools to more safely manage incidents. The HME Characterization program 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 program 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. The results of this work is evident in airports across the country, and is shared with government aviation security organization around the world. 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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	10,850	10,350	8,750	8,550	12,000
Obligations	9,936	9,532	7,962	0	

FY 2016 Key Milestone Events (Prior Year)

- 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 micro CT data, and deliver source code, phantoms, and a final report to TSA.

FY 2017 Key Milestone Events (Year of Execution)

- Begin testing and analysis for HME and sheet blast loading data.
- Deliver Homemade Explosives Safety Standards to Interagency users.
- Deliver Ammonium Nitrate Booster Study results to support TSA Freight and Rail Security Policy.
- Provide USSS with Anomaly Detection Prescreening test report.
- Deliver Homemade Explosives Training course for Transportation Security Administration-Office of Security Operations.
- Deliver eight new HME detection windows to TSA for incorporation into existing and future bulk and trace explosives screening systems (FY 2017).
- Kick off Homemade Explosive Simulant Certification Program.
- Complete Task II and III: Engineering Porosity in Energetic Materials with a PowderBed Printer.
- Kick off the Explosive Threats Rapid Response Protocols project.
- Evaluate energy profiles of designated explosive materials identified by TSA's DSARM model for inclusion in the Scenario- and Target-Relevant Explosive Equivalency Tool (STREET) and DHS's Transportation Security Laboratory (TSL) Commercial Aviation Vulnerability and Mitigation (CAV&M) research.
- Deliver HME Safety Protocols to HME International Working Group.
- Deliver the Detection Standards Analysis and Revision Methodology (DSARM) to the TSA which will result in standard threat prioritization.
- Collect explosive performance on a rapid response effort at the Tyndall Reactive Materials Site and deliver information to the TSA.
- Support TSL DT&E and IT&E leads for system data collection at the Tyndall Reactive Materials Site.
- Kick off operations at the DHS Detection Technology Center in close collaboration with the FBI's Terrorist Explosives Device Analytical Center (TEDAC) Improvised Explosives Detection and Synthesis (TIEDS) Center.
- Aid the DoD and Law Enforcement by providing data on the impact of a large scale potassium chlorate study which will enable better protection for vulnerable targets and infrastructure.

FY 2018 Key Milestone Events (Budget Year)

- Obtain results from Transportation Security Equipment to support material characterization studies, including Region of Responsibility (ROR) research for X-ray based detection technologies, characterization studies of Homemade Explosives (HME), and quality control efforts supporting testing services by the TRMG, LLNL, TIEDS, and the TSL.
- In collaboration with the FBI, provide results to the Chemical Facility Anti-terrorism Standards for precursor detonability data which will enable NPPD to make changes to their upcoming Notice for Proposed Rule Making on explosive and HME chemical precursors using validated scientific data.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Delivered data collected at the Tyndall Reactive Materials Group and analyzed at LLNL in response to intelligence information. This data was used to validate the FY16 TSA Detection Standards updates for AIT, Advanced Technology (AT) systems, and EDS.	FY 2014 Q4	FY 2016 Q3
Completed a Feasibility Study Final Report for the Explosive Terrorism Risk Assessment (ExTRA) and concluded that the expansion of the Chemical Terrorism Risk Assessment (CTRA) methodology to include the treatment of explosives is very feasible with a high probability of success.	FY 2015 Q2	FY 2016 Q2
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.	FY 2014 Q4	FY 2016 Q2
Completed a series of tests to determine if threat quantity amounts of a series of powdered metals and precursors would alarm on metal detectors that are on the GSA/TSA Qualified Product List.	FY 2016 Q2	FY 2016 Q3
FY 2017		
Characterize the chemical, physical, and explosive properties of HMEs and report findings to TSA and interagency partners to support requirements development.	FY 2014 Q4	FY 2017 Q4
Completion of a 10,000 lbs Potassium Chlorate VBIED demonstration	FY 2016 Q4	FY 2017 Q3

Research & Development Description	Plan Start Date	Planned Completion
and delivery of an accompanying quick look report.		
Delivery of a demonstration on the ability to print a nominal object with an engineered porosity as well as data showing the detonation properties of printed objects.	FY 2015 Q4	FY 2017 Q4
Complete consequence model development for the Explosives Terrorism Risk Assessment.	FY 2016 Q2	FY 2017 Q4
Deliver Homemade Explosives Training course for TSA-Office of Security Operations.	FY 2015 Q4	FY 2017 Q1
Deliver a software training package for X-ray image recognition to the United States Secret Service.	FY 2017 Q1	FY 2017 Q4
Develop new capabilities within IMPACT specifically tailored to United States Capital Police (USCP), Washington D.C. Metropolitan Police and other Law Enforcement agency applications.	FY 2017 Q1	FY 2017 Q4
FY 2018		
Deliver explosive equivalency information to the TSA for updating their detection standards.	FY 2015 Q4	FY 2018 Q4
Completion and delivery of certification guidelines for Professional Standards for Explosives Design and Testing Engineers and Architect.	FY 2016 Q2	FY 2018 Q3
Obtain results from the MicroCT X-ray systems support material characterization studies, including Region of Responsibility (ROR) research for X-ray based detection technologies, characterization studies of HME, and quality control efforts supporting testing services by the TRMG, LLNL and the TSL.	FY 2014 Q4	FY 2020 Q4
Deliver up to six DTRA/SCC-WMD hosted VAPO classroom training courses (four Level 1 with three in DC Area and one in Albuquerque) and two Level 2 (in the DC Area).	FY 2017 Q2	FY 2018 Q3
Deliver precursor percentage data to CFATS from FBI studies and hold first meeting on Global Initiative on precursor percentage regulations.	FY 2016 Q1	FY 2018 Q1

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 five to ten Regions of Responsibility per year that will update the TSA detection standards and lead to improved detection algorithms being deployed at airports.
- Provide the HME Working Group with explosives characterization data to include safety information, data to assist with explosive detection equipment and the sensitivity of explosive detection technologies, and threat validation documentation at least once a year.
- 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 for DHS NPPD.
- The rollout of Incident Management Preparedness and Coordination Tool Kit (IMPACT) will enhance situational awareness, communication, and collaboration during and for security events. Transition the HME Database to a permanent database, with a designated U.S. government agency, for use by the HME community.

Hostile Behavior Predict and Detect - FY 2017 Annualized Continuing Resolution: $47.515M. FY 2018 Request: $34.493M. 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:** Violent extremism in the U.S. is a growing problem; however, the drivers behind violent extremism are not fully understood. Analyses of extremist violence are currently based on a limited number of case studies, and the effectiveness of programs developed to counter violent extremism (CVE) is often not clear.

- **Solution:** DHS S&T conducts evidence-based research to meet the policy, operational and public needs to improve the effectiveness of violence prevention and intervention efforts implemented by federal, state, local, tribal, territorial and non-governmental stakeholders.

- **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 (OCP), 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.

Sub Project

- Metrics Development and Evaluation of DHS CVE Community Awareness Briefings (CAB): Evaluate the effectiveness of the existing community awareness briefings, historically delivered by the DHS Office of Civil Rights and Civil Liberties and the National Counterterrorism Center. The results will be used to assist with the update and modification of the program as it transitions to the DHS Office for OCP.
- International Expert Engagement and Analysis of CVE Evaluations: DHS S&T hosted international expert elicitation convened to share research, findings, and best practices, and discuss metrics, methods, results, and lessons learned from existing countering violent extremism program evaluations.
- Evaluation of CVE Community Grants: Independently evaluate the effectiveness of select programs initiated through the OCP CVE Grant Program.
- Text-Enabled Safe Referral Hotline Protocols and Evaluation: Develop protocols that can be used by existing hotlines to offer CVE services.
- CVE Operation Roadmap: Identify CVE stakeholder needs and requirements and develop a library of CVE research.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	1,001	1,000	2,500	1,000	1,000
Obligations	1,086	2,663	983	0	

FY 2016 Key Milestone Events (Prior Year)

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

FY 2017 Key Milestone Events (Year of Execution)

- 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.

FY 2018 Key Milestone Events (Budget Year)

- Deliver an impact evaluations of pilot city efforts to understand what activities have been successful.
- Develop a catalog of common metrics used by evaluators of local extremist violence prevention and intervention programs internationally.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Complete Data upload for TEVUS.	FY 2016 Q1	FY 2016 Q4
Final report of Risk and Crisis Communication priorities submitted.	FY 2015 Q4	FY 2016 Q2
Interim Reports of needs and requirements of CVE Stakeholders across Interagency, National NGOs, and local communities submitted.	FY 2015 Q4	FY 2016 Q4
FY 2017		
Public Launch of TEVUS.	FY 2017 Q1	FY 2017 Q1
Public Launch of PIRUS.	FY 2017 Q2	FY 2017 Q2
Deliver Formative Evaluation in Los Angelas (LA) and Boston.	FY 2015 Q4	FY 2017 Q1
Develop transition plan for Hotline Protocols and identify transition partner.	FY 2016 Q4	FY 2017 Q1
FY 2018		
Deliver Impact Evaluation in LA and Boston.	FY 2017 Q1	FY 2018 Q2
Transition common metrics used for evaluation by the international community to researchers and community stakeholders.	FY 2017 Q3	FY 2018 Q2
Deliver metrics and evaluation of Community Awareness Briefings to OCP.	FY 2017 Q3	FY 2018 Q3

Research & Development Description	Plan Start Date	Planned Completion
Conduct a process evaluation for hotline protocols.	FY 2018 Q1	FY 2018 Q4
Finalize Data and Literature library for CVE.	FY 2016 Q1	FY 2018 Q1

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.

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 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 Federal Aviation Administration is in the process of setting rules for the use of UAS/NTAT/AS to prevent interference with general aviation. DHS is responsible for securing the national airspace against nefarious UAS use. Currently, DHS Components have limited capabilities to detect, track, identify, and respond.
- **Solution**: (1) Connect DHS Components needs to available solutions by first developing a tool, the Counter Small UAS Analysis and Review Tool (C-SMART) then exercising C-SMART to assess, advise, integrate, and evaluate CUAS capabilities. This tool includes modeling & simulation, databases of CUAS performance data, libraries of UAS threat

characteristics, and cost/benefit analytics; (2) Embark on specific endeavors to modify/tailor technologies to address urgent needs that cannot be met by COTS; and, (3) With the rapid pace of change in the UAS market and its technologies, ensure there is an ability to predict and characterize future UAS threats in order to guide future RDT&E.

- **Impact**: Through the leadership role of DHS at the interagency level and our technical efforts, DHS Components will be well advised and positioned to acquire CUAS capabilities that are most effective and efficient, employing those capabilities with the most suited concepts of operations informed by clear policies and rules of engagement. The project will inform DHS Components' acquisition strategy of new CUAS capabilities, upgrade targeted capabilities, all while supporting National Special Security Events (NSSE).

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	20,000	19,386	19,000
Obligations	-	-	18,241	0	

FY 2016 Key Milestone Events (Prior Year)

Note: S&T stood up a new Program Executive Office for UAS in May 2016 to better focus all of our UAS-related activities (enabling as well as countering UAS) and to better collaborate at the interagency level. The originally planned effort to develop a specific new CUAS system, starting in 2016, was re-directed under this new thrust. As such, the key 2016 milestones were revised as shown below:

- Develop a UAS Strategy for DHS S&T and begin implementation.
- Develop a mobile capability to conduct experimentation, testing, and evaluation of CUAS systems in-situation.

FY 2017 Key Milestone Events (Year of Execution)

- Under the auspices of the National Security Council Policy Coordination Committee (PCC), establish a CUAS Technology Working Group delivering a compendium of CUAS technology to the PCC.
- Begin collecting preliminary customer's requirements and use cases to inform C-SMART development.
- Release C-SMART 1.0 to support National Special Security Events.
- Upgrade C-SMART 1.0 to allow more complex and flexible analysis.

- Begin development of a CUAS test and evaluation capability within the National Capital Region for an urban operational prototype (UCOP).
- Conduct Technical Assessment of Counter UAS Technologies in Cities (TACTIC) I Phase 1
- Develop and deliver Initial Operation Capability 1 for the USSS.
- Begin development of Capability 2 for USSS.
- Begin characterization of future threats.

FY 2018 Key Milestone Events (Budget Year)

- Release CSMART 1.X versions with geospatial information system extensions and virtual reality capabilities
- Integrate multi-sensor capabilities into UCOP.
- Conduct TACTIC I Phase 2.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Inter-Agency & International Collaborations	FY 2017 Q1	Ongoing
Customers' Requirements Assessment & Refinement	FY 2017 Q1	Ongoing
C-SMART Development	FY 2017 Q1	Ongoing
UCOP Spiral 1 Development	FY 2017 Q3	FY 2018 Q2
Develop Initial Operation Capability 1 for USSS	FY 2017 Q2	FY 2017 Q4
Develop Initial Operation Capability 2 for USSS	FY 2017 Q2	FY 2018 Q2
Future Threats Characterization	FY 2017 Q3	Ongoing
TACTIC I	FY 2017 Q2	FY 2018 Q2

Type of Research

Developmental

Technical Readiness Level

TRL will vary depending on specific efforts.

Transition Plans

Capability 1 and Capability 2 systems will transition to the USSS.

Results of using C-SMART to assist a customer will transition to that customer to assist in operation or acquisition efforts. For example: C-SMART v 1.0 was exercised to assist USSS and FBI in laying out their CUAS capabilities on hand in support of the Republican National Convention, the Democratic National Convention, and the Presidential Inauguration.

The UCOP will be an enduring T&E capability for PEO UAS and USSS. Certain UCOP components might transition as interim or permanent operational capabilities for USSS if deemed beneficial.

Hostile Intent Detection and Surveillance

- **Problem:** TSA screens approximately two 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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	4,950	8,700	4,000	2,000	0
Obligations	4,824	3,763	3,329	1,500	

Prior Year Key Events

Awarded new contract for transition of FAST capabilities and research.

Current Year Key Events

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

Budget Year Key Events

N/A

Project Schedule Including Milestones

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Complete data ingest from collection activities at Providence International Airport (PVD).	FY 2016	FY 2016
Complete video data annotation and obtain input from Behavior Detection Officers (BDO).	FY 2016	FY 2016
Field Test for BDO surveillance via telepresence/Readiness Research Field Test/operational technology presence.	FY 2016	FY 2016
FY 2017		
Field Test for BDO surveillance via telepresence/Readiness Research Field Test/operational technology presence.	FY 2017	FY 2017
Operational technology demonstration and evaluation of centralized	FY 2017	FY 2017

Research & Development Description	Plan Start Date	Planned Completion
screening. ASR Settling Time and Real-Time Decision Analysis Scientific Study		

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.

Social Media Research

- **Problem:** Leveraging open source and social media (OSSM) effectively has become increasingly important to DHS missions, as an increasing amount of data becomes available online. OSSM tools that support DHS missions are in an immature, early stage. There are major challenges including but not limited to the need to scale tools to the levels of DHS operations; controlling the vast amount of "noise" while respecting privacy and civil liberties; and automatically processing non-text data such as video and images to efficiently cue information of interest for analysts, officers, and agents.

- **Solution:** Piloting commercial tools within the Homeland Security Enterprise enables DHS to fully explain OSSM challenges in operational contexts, develop and improve OSSM methodologies, capture gaps in commercial tools and architectures, develop first generation capabilities for non-text data, and work with industry to develop additional capabilities.

- **Impact:** OSSM methodologies that have been incorporated into operations at DHS Components. DHS also delivered a market survey of 275 commercial tools that included laboratory testing of the top tools. DHS is able to explain the OSSM challenges, backed by data and metrics collected during the pilots, to inform future investments.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	2,500	2,500	5,056
Obligations	-	-	0	0	

Prior Year Key Events

- Completed two pilots (K-1 and Iraqi/Syrian Refugees) that led to developing an OSSM methodology incorporated into USCIS operations and identifying major gaps in commercial capabilities.
- Completed one pilot for CBP's Electronic System for Travel Authorization (ESTA) that supports the visa waiver program. This pilot resulted in the potential to improve efficiency and effectiveness of OSSM research.
- Completed one test of capabilities for processing speech, images, and videos to inform future investments.

Current Year Key Events

- Finalize market survey of commercial OSSM tools.
- Conduct operational tests for USCIS, CBP, and TSA using commercial capabilities. Measure improvements, capture gaps, and inform USCIS, CBP, and TSA procurement decisions.
- Develop and evaluate new capabilities for processing speech, images, and videos.

Budget Year Key Events

- Complete report on findings of DHS OSSM needs based on S&T pilots.
- Conduct tests of image, video, and speech within the HSE.
- Deliver reports on image, video, and speech analytic experiments to improve open source and social media analytics for DHS missions.

Project Schedule Including Milestones

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Deliver report on image, video, and speech analytic experiments to improve open source and social media analytics for DHS missions.	FY 2018 Q1	FY 2018 Q2
Deliver report on DHS social media gaps and requirements that would inform future investments.	FY 2018 Q1	FY 2018 Q2
Develop and assess livestream prototypes and experiments.	FY2017 Q2	FY 2018 Q4

Type of Research

Social Media Research projects include elements of Basic, Applied, and Developmental research.

Technical Readiness Level

Projects range from Technology Readiness Level 2 to 7.

Transition Plans

Social Media tools undergo an operational test pilot with end users. Pilots enable end users to make acquisition decisions. The pilots are supported by the respective DHS Component leadership who hosts S&T staff onsite to conduct the testing. The DHS Social Media Task Force, consisting of DHS-wide organizations, including the Office of the Chief Financial Officer, Office of Privacy, and Office of Civil Rights and Civil Liberties, oversees the pilots and addresses oversight issues before pilots begin to facilitate future transition.

Silicon Valley Innovation Program (SVIP)

- **Problem:** As the needs and technology gaps of DHS operational agencies and critical infrastructure partners continue to evolve, DHS needs to pursue multiple paths to innovative solutions for these needs. Lengthy procurement processes have created barriers for entry for innovative high-tech commercial small businesses thus limiting the Government's access to relevant and timely solutions to meet these evolving needs.

- **Solution:** The SVIP expands DHS's reach to find new technologies that strengthen national security with the goal of reshaping how government, entrepreneurs and industry work together to find cutting-edge solutions. The SVIP reaches out to innovation

communities across the nation and around the world to harness the commercial R&D ecosystem for government applications, co-invest in ideas, and accelerate transition-to-market. The SVIP also involves DHS operational components and end users and HSE stakeholders throughout each project, thereby increasing the likelihood of successful transitions that meet operational needs.

- **Impact:** The SVIP aims to provide novel solutions for component and HSE requirements that can be used in operations in as little as 12-24 months. Further the program is drawing new companies into interactions with and work in support of the Government who may not have previously engaged with the Government. Bringing in new companies increases avenues by which DHS and its partners can obtain and leverage innovative technology and solutions.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	5,000	10,000
Obligations	-	-	-	0	

FY 2016 Key Milestone Events (Prior Year)

- Release the umbrella Innovation Other Transaction Solicitation (OTS).
- Release call under the Innovation OTS for IoT Security, and four calls under the OTS for requirements in support of Customs and Boarder Protection: K9 Wearable Technologies, Enhancements to the Global Travel Assessments System (GTAS), Enhancing CBP Airport Passenger Processing, and Small Unmanned Aircraft Systems (sUAS) Capabilities.
- Award five (5) Phase I Other Transaction (OT) Agreements and two (2) Phase II OT Agreements to companies under the IoT Security solicitation.

FY 2017 Key Milestone Events (Year of Execution)

- Release new solicitation calls in 3 – 5 specific areas covering broad DHS and critical infrastructure needs including finance sector cyber security, first responders and aviation security.
- Award OT Agreements in support of CBP, Financial Services Cyber Security Active Defense (FSCSAD), and IoT specific calls.
- Conduct outreach events in innovation communities beyond Silicon Valley including Boston, MA, Austin, TX, Washington, DC, and Seattle, WA.

FY 2018 Key Milestone Events (Budget Year)

- Release new solicitation calls in 3 – 5 specific areas covering broad DHS and critical infrastructure needs.
- Award Phase IV OT Agreements in support of IoT Security call and assess operational readiness for IoT Security solutions that have completed Phase IV.
- Award Phase III and Phase IV OT Agreements in support of CBP specific calls.
- Award Phase II and Phase III OT Agreements in support of FSCSAD call.
- Award Phase I and Phase II OT Agreements in support of additional calls released in FY17.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Umbrella Innovation Other Transaction Solicitation	FY 2016 Q1	FY 2021 Q1
IoT Security Solicition supporting IoT Security requirements	FY 2016 Q1	FY 2017 Q1
FY 2017		
Solicitation Calls in Support of CBP Requirements	FY 2016 Q4	FY 2017 Q4
Solicitation Call in Support of Financial Sector Cybersecurity Requirements	FY 2017 Q1	FY 2018 Q1
Solicitation Call in Support of First Responder Requirements	FY 2017 Q2	FY 2018 Q2
FY 2018		
Solicitation Call in Support of Aviation Security Requirements	FY 2018 Q1	FY 2018 Q4

Type of Research:

Developmental

Technical Readiness Level

Specific company solutions are expected to begin Phase I at a minimum TRL-3 and solutions that successfully progress through Phase IV should finish at a TRL-7.

Transition Plans

- The transition plan is specific to each solicitation call and the operational partner a given call is supporting. Typically the plan will lead to commercialization of a technology solution that would then be purchased either by a specific DHS operational component (e.g., CBP) or the appropriate HSE critical infrastructure partner (e.g., Financial Sector, First Responders). Phase III and IV of the SVIP involve operational pilots and customers/end users are involved throughout each phase of the program to increase the likelihood of successful transitions.

Enabling UAS Technologies

- **Problem**: First Response and Disaster Management agencies will benefit from the use of UAS to help command and control response, restore communications, improve situational awareness and damage assessments, all while protecting the lives of First Responders. Moreover, while the FAA/NASA led unmanned traffic management system will address flight safety, DHS needs to ensure its security concerns are addressed.

- **Solution**: This project identifies, tests and evaluates small UAS with integrated sensors in realistic, operationally relevant scenarios for First Responders. Some examples include search and rescue, firefighting, emergency medical services, emergency management and disaster response. Additionally, the project provides the unmanned aerial traffic community use cases that address specific security concerns.

- **Impact**: First Responders will be capable of making better acquisition decisions. The future unmanned traffic management system will enable the safe, secure and reliable integration of UAS into the national airspace.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	-	2,000
Obligations	-	-	-	-	

Prior Year Key Events (FY 2016)

- First Responders Resource Working Group (FRRG) on Emerging Technologies identified small UAS as a topic both for their benign use and countering nefarious uses.

Current Year Key Events (FY 2017)

- Conduct analysis of technologies for countering the threat of illicit techniques (GPS spoofing, network hacking, cell data skimming, etc.) in order to enable safe and effective use of small UAS in operational environments.
- Establish a dedicated FRRG small UAS work group to develop use cases and mission requirements of small UAS.

Budget Year Key Events (FY 2018)

- Identify and refine testing requirements from the First Responder community.
- Award contract(s) for one or more test sites supporting all necessary testing for First Responders enabling small UAS

*Up to 2017, all efforts related to Enabling UAS were funded and executed as part of the Air-Based Technologies project. Starting in 2018, Enabling UAS will become a separate project.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Develop and prioritize a list of test scenarios for the First Responder mission	FY 2017 Q4	FY 2018 Q2
Identify and evaluate commercially available First Responder Test/Training centers for use as small UAS test sites	FY 2018 Q2	FY 2018Q3
Contract with selected test sites to provide test environments and test services	FY 2017 Q2	FY 2018 Q1
FY 2018		
Identify homeland security use cases for the unmanned traffic management system	FY 2018 Q2	FY 2018 Q3
Incorporate homeland security use cases into planned unmanned traffic management demonstrations	FY 2018 Q3	Ongoing

Type of Research

Developmental

Technical Readiness Level

TRL will vary depending on specific efforts.

Transition Plans

- The project's test and evaluation results and associated analysis will be made available the First Responder community and posted on the DHS First Responder website.

Threat Horizon

- **Problem:** The threat landscape facing the HSE is constantly evolving with technology or modification of existing tactics and methods. S&T's R&D is devoted to enhancing or adding capabilities for the HSE to strengthen the nation's overall security posture in the short- to long-term. New threats come up throughout any FY that require immediate attention to provide Components and operational partners with the knowledge or technical solutions needed to maintain or advance their security posture and tempo. The Directorate does not currently have a mission readiness cell dedicated to providing a quick-turnaround analysis and R&D response to emerging situations.

- **Solution:** The Threat Horizons program will anticipate and respond quickly to any emerging, novel, or previously undetected threats facing the homeland. Identification of such threats may come from a number of channels, including Components, the Secretary's office, or through interagency partners. Threat Horizon will first determine whether such a request qualifies as "time-critical task" under established S&T procedures. If it does, Threat Horizon will utilize its resources and subject matter expertise across S&T to create a time critical task action plan to be submitted to the Under Secretary. The action plan will provide an analysis of each threat and provide options for response. Should the Under Secretary accept the action plan, Threat Horizons will coordinate assignments of personnel and financial resources to execute and sustain the plan. Any program-initiated efforts that need to be sustained beyond the short-term may be transitioned to existing R&D programs or scaled to be stand-alone efforts. In addition, Threat Horizons will produce quarterly status reports for the Chief Scientist describing all ongoing responses and providing a brief overview of the landscape.

- **Impact:** Under this program, DHS will be able to assess and respond rapidly to emerging, novel, or previously undetected threats, while maintaining continuity of coverage in other mission areas covered by S&T. By serving as the go-to mission readiness cell for the Department, this investment will mitigate the risk of unforeseen or emergent challenges in any mission area.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	-	7,926
Obligations	-	-	-	-	

FY 2018 Planned Key Milestone Events (Budget year)

- Respond to time-critical tasks and emergent threats that require rapid action plans, resourcing and knowledge products or technical solutions.
- Provide quarterly reports to the Chief Scientist describing future or emerging threats.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Respond to time-critical tasks as requested by the Secretary, Under Secretary, Components, or interagency partners.	FY 2018 Q1	FY 2018 Q4
Provide a year-end closeout report providing a summary of trends in the threat landscape and a review of impact and outcomes for all time-critical tasks managed in the Fiscal Year.	FY 2018 Q4	FY 2018 Q4

Type of Research

Applied

Technical Readiness Level

This program will manage activities with varying TRLs, depending on the nature of threats and potential solutions.

Transition Plans

- S&T will work closely with operational partners who request assistance from Threat Horizons to ensure that customer needs are addressed in all knowledge products or technical solutions.
- Any Threat Horizons analysis or recommendation that identifies the need for continued R&D beyond a very short time horizon may be transitioned to existing S&T R&D programs, or used as the basis to initiate stand-alone programs, as appropriate.

Identity Management Program FY 2017 Annualized CR: $0.800M. FY 2018 Request: $1.500M. This program researches and develops biometrics-based technologies, procedures, CONOPS, and information to identify known terrorists and criminals and prevent their movement into and out of the United States through effective, interoperable multi-biometrics in diverse areas, including border crossings, ports of entry, and visa application sites.

Digital Forensics (formerly Non-Cooperative Biometrics)

- **Problem:** Each week over 900,000 images are seized in new child exploitation cases and growing exponentially. There are over 190 million child exploitation images in the current database. With only 6,000 law enforcement personnel available to fight child exploitation, agents are overwhelmed and outnumbered and find it nearly impossible to identify and locate innocent victims and heinous perpetrators who will continue their abuse until forced to stop. While technological advances have improved our ability to identify human traffickers over the last decade, research into the social and behavioral factors that can be used to identify human traffickers and perpetrators of child exploitation is lacking.

- **Solution:** This Program will design, develop, test and integrate new algorithms that will give law enforcement agents the ability to sift through massive amounts of digital data much quicker than their current manual process and therefore locate victims and perpetrators much faster. DHS S&T will conduct evidence-based research to meet the policy, operational and public needs to improve the effectiveness of understanding how to identify human traffickers and perpetrators of child exploitation on and off line.

- **Impact:** This Program will provide agents with the ability to dramatically speed up the process of initial triage and the subsequent necessary forensic deep dive analysis of seized child exploitation digital imagery, increasing an agent's effectiveness while drastically limiting the amount of time an agent must subject themselves to traumatizing material, thus increasing the number of children recognized and therefore saved from a life of abuse. New capabilities will support more efficient and accurate analysis. This project improves the capability of the DHS ICE and DHS Homeland Security Investigations (HSI).

Sub Project

- Operational Roadmap - Human Trafficking: Identify human trafficking stakeholder needs and requirements to assist in building a research portfolio that is useful to end-users.
- Operational Roadmap- Child Exploitation: Identify child exploitation stakeholder needs and requirements to assist in building a research portfolio that is useful to end-users.

- Consumer or Producer: Develop a method for identifying consumers of child pornography and producers of child pornography based on online behavior.
- Child Exploitation Image Analysis Project: Design, develop, test and integrate new face, text and object detection and recognition algorithms that will allow agents to sift through massive amounts of data much faster and efficiently than their current manual process.
- Camera ID Project: Design, develop, test and integrate new algorithms that characterize a camera's sensor pattern noise (like finger prints for each individual camera) allowing forensic analysts to match still and video images from the same camera thus giving law enforcement agents the ability to identify and locate victims and perpetrators when the illicit material does not include faces but other non-illicit material from the same camera does. This work will also allow forensic analysts to cluster images from the same camera based on the sensor noise pattern (unique signature/fingerprint) which will drastically reduce the amount of time necessary to locate victims and perpetrators.
- Electric Network Frequency: Design, develop, test and integrate new algorithms that identify unique electric frequency signals imprinted on video and voice recordings that are indicative of the electric grid of a region, e.g. U.S, vs. Europe, Southwest U. S. vs. East Coast, where the recordings were created thus allowing law enforcement agents to narrow down a geographic location where the recordings were created.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	2,000	3,900	-	800	1,500
Obligations	1,792	3,593	-	50	

FY 2016 Key Milestone Events (Prior Year)

Child Exploitation Image Analysis Project

- Ground truthed seized child exploitation video and still digital data for faces and text in preparation for testing.
- Assessed performance of face and text detection and recognition algorithms against the child exploitation data set (phases 1 & 2).

FY 2017 Key Milestone Events (Year of Execution)

- Integrate face detection and recognition algorithm(s) into the current ICE HSI forensic tool using the application programming interface created in FY 2016.
- Develop a software development kit, application programming interface, and data interchange format in preparation for a full system integration of sensor pattern noise algorithms for Camera ID.

FY 2018 Key Milestone Events (Budget Year)

- Complete literature reviews that identify and address current research in human trafficking and child exploitation. Match this literature review to stakeholder needs and requirements.
- Perform operational test pilot of system in forensic tool for Camera ID and Child Exploitation Image Analysis.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Design, develop and test new face detection & recognition algorithms and sensor pattern noise algorithms that will give law enforcement agents the ability to sift through massive amounts of data much quicker than their current manual process and therefore locate victims and perpetrators much faster.	FY 2018	FY 2019
FY 2017		
Integrate new face detection & recognition capability into current forensic tool and complete design and development of sensor pattern noise algorithms that will give law enforcement agents the ability to sift through massive amounts of data much quicker than their current manual process and therefore locate victims and perpetrators much faster.	FY 2017	FY 2020
Operational Roadmap- Human Trafficking: Identify operational human trafficking stakeholders, and select the methods by which their needs and gaps will be elicited. Survey current social and behavioral research pertaining to human trafficking.	FY 2017	FY 2019
FY 2018		

Research & Development Description	Plan Start Date	Planned Completion
Complete testing and piloting face detection and recognition algorithms. Integrate, test and pilot new sensor pattern noise algorithms within current forensic tool that will give law enforcement agents the ability to sift through massive amounts of data much quicker than their current manual process and therefore locate victims and perpetrators much faster. Design, develop and prepare to test and integrate new Electric Network Frequency algorithms that will give law enforcement agents the ability to sift through massive amounts of data much quicker than their current manual process and therefore locate victims and perpetrators much faster.	FY 2018	FY 2019
Budget Year: Operational Roadmap- Human Trafficking: Identify operational human trafficking stakeholders, and select the methods by which their needs and gaps will be elicited. Survey current social and behavioral research pertaining to human trafficking.	FY 2018	FY 2019
Budget Year: Operational Roadmap- Child Exploitation: Identify operational human trafficking stakeholders, and select the methods by which their needs and gaps will be elicited. Survey current social and behavioral research pertaining to child exploitation.	FY 2018	FY 2019

Type of Research

Applied

Technical Readiness Level

TRL will vary between specific portfolio projects.
Child Exploitation Image Analysis Project - TRL 6
Camera ID Project - TRL 5
Electric Network Frequency - TRL 5

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.

- Child Exploitation Image Analysis Project: Technology Transition Agreement signed between DHS S&T FRG and ICE Child Exploitation Investigations Unit (CEIU) who stress their need for these technologies and operational ease in integrating new algorithms to their current forensic tool set for immediate operational use.
- Camera ID Project: Technology Transition Agreement signed between S&T FRG and ICE CEIU who stress their need for these technologies and operational ease in integrating new algorithms to their current forensic tool set for immediate operational use.
- Electric Network Frequency: Technology Transition Agreement signed between S&T FRG and ICE CEIU who stress their need for these technologies and operational ease in integrating new algorithms to their current forensic tool set for immediate operational use.

6. Cyber Security/Information Analysis – FY 2017 Annualized Continuing Resolution: $66.483M. FY 2018 Request: $46.248M. 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, law enforcement forensic capabilities, secure protocols, and software assurance.

Cyber Security Research Infrastructure – FY 2017 Annualized Continuing Resolution: $10.847M. FY 2018 Request: $0. This program provides the infrastructure necessary to support the R&D that is critical for matching and adapting cyber threats. 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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	3,940	4,000	3,500	4,132	0
Obligations	3,623	3,272	970	336	

Prior Year Key Events

Increase overall testbed capacity and scaling capabilities.

Current Year Key Events

Awarded 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.

Budget Year Key Events

N/A

Project Schedule Including Milestones

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Increase overall testbed capacity and scaling.	FY 2016	FY 2016
FY 2017		
Award follow on work for next generation experimental research testbed, new experimentation tools and independent testing and evaluation services.	FY 2017	FY 2017

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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	3,515	4,000	4,000	3,616	0
Obligations	3,229	3,683	3,485	756	

Prior Year Key Events
Created a program structure to support the cataloging, hosting, and/or mirroring of International datasets.
Established agreements with the EU and individual countries in Europe.

Current Year Key Events
Expand legal framework to support sharing data collected internationally.

Budget Year Key Events
N/A

Project Schedule Including Milestones

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Create a program structure to support the cataloging, hosting and/or mirroring of International datasets.	FY 2016	FY 2016
Establish agreements with the EU or individual countries in Europe and Singapore.	FY 2016	FY 2016
FY 2017		
Expand legal framework to support sharing data collected internationally.	FY 2017	FY 2017

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 will exist as an enduring infrastructure level resource.

Cyber Transition and Outreach – FY 2017 Annualized Continuing Resolution: $6.715M. FY 2018 Request: $0. This program accelerates the transition of new and existing cybersecurity technologies, 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 and strengthens 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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	11,108	7,460	5,000	5,165	0
Obligations	10,172	9,024	5,670	2,565	

Prior Year Key Events

Conducted five industry specific technology demonstrations with the public and private sectors to include the finance and energy sectors.
Transitioned three technologies via license or open source in order to make commercially available.
Piloted three technologies in production environments with public or private sector partners.
Conducted a comparative analysis of past red-teaming efforts and developed cross-cutting lessons learned.
Conducted four collaboration events.
Provided two red-teaming reports and vulnerabilities assessments.

Current Year Key Events

Conduct four to six collaboration events (IT Security Entrepreneur Forums, Infosec Technology Transition Council, 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.

Budget Year Key Events

N/A

Project Schedule Including Milestones

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Conduct five industry specific technology demonstrations with the public and private sectors to include the Finance and Energy sectors.	FY 2016	FY 2016
Pilot three to six technologies in production environments with public or private sector partners.	FY 2016	FY 2016
Conduct four to six collaboration events.	FY 2016	FY 2016
FY 2017		
Conduct four to six collaboration events (IT Security Entrepreneur Forum, Infosec Technology Transition Council and others).	FY 2017	FY 2017
Identify and test/pilot/deploy at least two CSD funded technologies based on customer requirements.	FY 2017	FY 2017
Transition three technologies to the commercial market.	FY 2017	FY 2017
Pilot three to six technologies in production environments in the HSE.	FY 2017	FY 2017
Identify six to ten technologies that are candidates for transition.	FY 2017	FY 2017

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 a 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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	2,481	1,500	1,700	1,550	0
Obligations	2,280	1,798	1,206	394	

Prior Year Key Events
Tested DHS S&T funded technologies in cyber gaming challenges.

Current 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).

Budget Year Key Events
N/A

Project Schedule Including Milestones

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Test DHS S&T funded technologies in cyber gaming challenges.	FY 2016	FY 2016
FY 2017		
Conduct National and Regional Collegiate Cyber Defense Competition to provide leadership in the National Initiative for Cybersecurity Education (NICE).	FY 2017	FY 2017

Type of Research
Applied

Technical Readiness Level
TRL will vary between specific portfolio projects.

Transition Plans
The developed Computer Security Incident Response Team (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.

Information Analytics – FY 2017 Annualized Continuing Resolution: $5.000M. FY 2018 Request: $4.000M. 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:** Leveraging data sources to compute threats, impacts, risks, decision support, and situational awareness continues to become increasingly challenging due to the exponential growth of data, particularly data associated with the Internet-of-Things. Further, data analytics technologies, including computational, methodological, and systems components, rapidly evolve on six month innovation cycles making it difficult to track solution options.

- **Solution:** Keeping pace with growing data sets and rapidly evolving solutions 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 Homeland Security Enterprise. HSARPA has created the Data Analytics Engine (DA-E) and work center to assist in problem definition and solutions development for Department programs using relevant data sets, analytic methodology, technologies, and systems in collaboration with subject matter experts from government, industry, and academia. Further, DA-E works across disciplines to illuminate next generation problem sets and technologies (including social media and video analytics) to inform program planning, avoid technical obsolescence and prevent mission surprise.

- **Impact:** DA-E helps analysts, operators, and agents across DHS increase mission effectiveness by better leveraging data for decision-making. DA-E 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, and improve security and privacy protection across DHS analytics system investments.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	4,000	-	4,000
Obligations	-	-	0	1,503	

Prior Year Key Events

- Transitioned private cloud solution for information sharing to ICE Cyber Crimes Center, Child Exploitation Investigations Unit, to enable faster evidence sharing so that HSI agents around the world can respond more quickly to crimes occurring in their geographic area.
- Completed prototype for case deconfliction across 33 agencies and 8 Departments to improve inter-agency coordination on counter-proliferation.

- Created Red Hat compliance script to automate the validation of configuration compliance (i.e., checking configuration against specific DHS security requirements) to facilitate S&T and DHS FISMA scorecard reporting.

Current Year Key Events

- Complete cloud security studies, including cloud management tools, to enable DHS agencies to make informed decisions regarding cloud implementations.
- Complete a report comparing big data query tools.
- Evaluate advanced capabilities for fraud detection to support USCIS.

Budget Year Key Events

- Demonstrate automated reporting tools on a DHS use case to improve efficiency in operations.
- Conduct deep learning studies focused on potential DHS use cases.
- Document high-level gaps in High Performance Computing requirements.

Project Schedule Including Milestones

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Demonstrate automated reporting tools on a DHS use case to improve efficiency in operations.	FY 2017 Q4	FY 2018 Q2
Document high-level gaps in High Performance Computing requirements.	FY 2017 Q1	FY 2018 Q4
FY 2018		
Conduct deep learning studies focused on potential DHS use cases.	FY 2018 Q1	FY2018 Q4

Type of Research

Decision Analytics projects include elements of Basic, Applied, and Developmental research.

Technical Readiness Level

Decision Analytics projects range from Technology Readiness Level 2 to 7.

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.

Network and System Security and Investigations – FY 2017 Annualized Continuing Resolution: $43.921M. FY 2018 Request: $42.248M. 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.

- **Solution:** Develop new technologies, capabilities, and standards to assist law enforcement in cyber-crime investigations and the forensic analysis of technologies used in criminal activity.

- **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.

Sub Projects

- Anonymous Networks and Currencies - Criminals are increasingly exploiting the built-in privacy-enhancing protections for the legitimate use of anonymous networks and cryptocurrencies. The project works with the law enforcement community to develop cost-effective solutions to complement and expand their abilities to investigate online criminal activity.

- Cybersecurity Forensics - Almost all criminal investigations today include digital evidence. The project works with the law enforcement community to gather requirements and develop cost-effective solutions and capabilities for quick acquisition and analysis of information from a wide variety of electronic devices including cell phones, GPS devices, tablets, and vehicle infotainment systems.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	9,704	9,800	8,400	7,231	4,400
Obligations	8,507	8,140	6,531	1,000	

FY 2016 Key Milestone Events (Prior Year)

- 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.

FY 2017 Key Milestone Events (Year of Execution)

- Initiate two new research and development activities in an expanded portfolio of state-of-the-art cyber forensics tools and techniques.
- Completion of privacy protecting network measurement research.
- Completion of cryptocurrency forensics tool pilot with law enforcement agencies.
- Complete operational pilots of next generation technology architecture for transition to law enforcement customers.

FY 2018 Key Milestone Events (Budget Year)

- Transition reference materials for the forensic acquisition and analysis of then commercially available devices to Cyber Forensics Working Group member agencies.
- Expansion of developed cryptocurrency forensics tool to address additional operational requirements of DHS law enforcement officers.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Pilot Vehicle Infotainment and Navigation Forensics project.	FY 2016 Q1	FY 2016 Q4
Complete law enforcement field interviews for illicit commerce requirements report.	FY 2016 Q1	FY 2016 Q3
FY 2017		
Develop initial, test-ready cryptocurrency forensics tool.	FY 2016 Q2	FY 2017 Q1
Baseline requirements for privacy protecting network measurement and initiate research.	FY 2016 Q4	FY 2017 Q3
FY 2018		
Complete acquisition and analysis tests for ten commercial devices.	FY 2017 Q4	FY 2018 Q2
Develop and test capability for operational expansion of cryptocurrency forensics tool.	FY 2018 Q1	FY 2018 Q4

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 field deployment.

Data Privacy and Identity Management

- **Problem:** Agencies and organizations lack 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.

Sub Projects

- Identity Management - The Identity Management project develops, tests, and evaluates interoperable tools, technologies, and standards to help manage authentication, identification, access control, fraud analytics, and compensating controls. This project seeks to identify solutions to increase security and productivity, while reducing costs and security risks.
- Data Privacy - The Data Privacy project develops, tests, and evaluates tools and standards for the management of personally identifiable information, automation of privacy controls, privacy implications of connected devices, big data, and anomaly detection. The project is working to ensure the protection of personal information consistent with public policy.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	4,837	1,151	0	3,822	2,606
Obligations	4,444	2,763	2,832	2,832	

FY 2016 Key Milestone Events (Prior Year)

- Delivered a tool, technology, or knowledge product for securing personally identifiable information within DHS.
- Transitioned 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 Key Milestone Events (Year of Execution)

- 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.

FY 2018 Key Milestone Events (Budget Year)

- Develop a tool, technology, or knowledge product that identifies non-person entities on a network in order to support homeland security applications such as Internet of Things identity, anti-spoofing and attribution.
- Catalogue, analyze, and create security and privacy compensating control design patterns that could be implemented by digital services to mitigate session and transactional behavior risks.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Backend Attribute Exchange	FY 2015 Q1	FY 2016 Q4
Mobile Visitor Log for PIV-I	FY 2015 Q3	FY 2016 Q4
FY 2017		
A Platform for Contextual Mobile Privacy	FY 2016 Q2	FY 2018 Q4
Identity and Data Privacy Ecosystem Map	FY 2016 Q2	FY 2018 Q4
FY 2018		
SuperIdentity for Non-Person Entities	FY 2017 Q3	FY 2019 Q3
Survey of Session and Transactional Behavior Risk Management Approaches	FY 2018 Q1	FY 2020 Q1

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:** In today's global and interconnected economy, the safe movement of people and cargo across the open skies is a crucial factor in promoting free trade and advancing prosperity and freedom. Detecting, identifying, and defeating the array of cyber threats to the Global Air Domain is a national imperative. Unfortunately, when the current majority of aircraft were designed, decades ago, cyber security was not considered. Commercial aircraft flying today are extremely vulnerable to cyber-attacks.

- **Solution:** Conduct the research to identify aircraft cyber vulnerabilities and develop mitigations to those vulnerabilities. Identify areas for strengthening cybersecurity within aircraft systems, but also create a robust assessment methodology and process that will be implemented to identify and eliminate threats to safe operation that emerge in the future.

- **Impact:** The commercial aviation industry represents roughly 5 percent of the U.S. Gross Domestic Product (GDP). Disrupting U.S. commercial aviation industry interests would have a significant national economic impact.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	3,000	3,000	2,000
Obligations	-	-	2,685	2,123	

FY 2016 Key Milestone Events (Prior Year)

- Secured a commercial aircraft and demonstrated a remote, non-cooperative penetration.

FY 2017 Key Milestone Events (Year of Execution)

- Conduct a cyber vulnerability assessment of the aircraft electrical system, the full automated digital electronic control (FADEC) system, and the flight management system (FMS).

FY 2018 Key Milestone Events (Budget Year)

- Cyber vulnerability assessment of aircraft telemetry system
- Cyber vulnerability assessment of aircraft power plant/engines

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Secure a commercial aircraft and demonstrate a remote, non-cooperative penetration	FY 2016 Q2	FY 2016 Q4
FY 2017		
Assessment of full automated digital electronic control (FADEC) system	FY 2017 Q3	FY 2017 Q4
Assessment of flight management system (FMS).	FY 2017 Q2	FY 2017 Q4
FY 2018		
Cyber vulnerability assessment of aircraft telemetry system	FY 2018 Q2	FY 2018 Q4
Cyber vulnerability assessment of aircraft power plant/engines	FY 2018 Q2	FY 201 8Q4

Type of Research

Applied

Technical Readiness Level

Technology Readiness Level 3 and Level 7

Transition Plans

- As vulnerabilities are discovered and mitigations developed, the results and findings will be shared with the Federal Aviation Administration (FAA) to determine the level of risk and seriousness. If assessed as a "safety of flight" issue, the FAA, as the regulator, will take appropriate action. If deemed less than a "safety of flight" issue, then DHS will work with the industry partners to implement mitigation strategies, process, and procedures.

Software Assurance

- **Problem:** There is a need to advance the science and technology for software quality assurance tools used to find defects in software. Modern software quality assurance tools generate too many false-positives and miss a good portion of actual defects in software.

- **Solution:** Maintain a collaborative research environment to advance software quality assurance capabilities by offering a collection of software quality assurance tools and assurance services. Allow developers to test and evaluate code for weaknesses that expose vulnerabilities in software, and provide tool developers an environment where they can test, calibrate, and improve the coverage area in their tools. Lead research and development efforts to modernize static analysis capabilities, improve synergies and integration with continuous delivery platforms, advance mobile application analysis, and proactive and automated threat analysis for application security.

- **Impact:** Solutions will reduce the number of weaknesses found in software, minimizing the attack surface of software. By applying the principle of continuous assurance throughout the software development process, developers are afforded the opportunity to detect bugs and defects in their software early in the software development process. Modernizing software quality assurance tools achieves security at-speed for tighter and seamless integration with continuous delivery platforms. The total cost of ownership to build and maintain software will be reduced as a result.

Sub Projects

- Application Security Threat and Attack Modeling (ASTAM) - ASTAM is a proactive analysis capability that monitors and actively protects systems and applications by identifying potential risks, security threats, and exposures to the system environment, and then developing appropriate countermeasures to prevent or mitigate the effects of threats to the system environment by bringing together independent assessment activities to build better situational awareness regarding potential threats.
- Static Tool Analysis Modernization Project (STAMP) - The goal of STAMP is to modernize a list of candidate software analysis tools (open-source) to improve tool performance and coverage, to seamlessly integrate and support continuous integration and developmental operational environments, provide stronger analysis of results by reducing false-positives, and provide more visibility into false-negatives that often leave residual risks. STAMP should advance the state-of-the-art capabilities found in software analysis tools.
- Software Assurance Marketplace (SWAMP) - Software has become an essential component of the Nation's critical infrastructure. It has grown in size, capability, and complexity at a rate that exceeds our ability to keep pace with quality software. The SWAMP is S&T's response to address the growing concern. This project provides a broad range of software assurance services and capabilities to help improve the quality and security of software as well as improve the overall capabilities in software quality assurance tools. SWAMP helps to formalize software assurance in organizations and

provides a collaborative research environment for tool developers and researchers to advance software assurance capabilities. This national-level resource will benefit the software assurance community for years to come.

- Software Quality Assurance - The growing reliance on software makes everyone vulnerable to cyberattacks. The complexity and size of software make it difficult for software quality assurance tools to identify potential vulnerabilities in software. The project is working to create and improve the techniques and capabilities used in static, binary, and dynamic analysis tools to help create a healthier and more secure software ecosystem.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	-	7,295
Obligations	-	-	-	-	-

FY 2018 Key Milestone Events (Budget Year)

- Develop working prototypes for Hybrid Analysis, Attack Threat Modeling, Attack Simulation and Countermeasures, and Compliance Monitoring and Assessment
- Develop test case and test datasets for STAMP to be transitioned to SWAMP.
- Develop tool modernization framework report and tool improvement analysis report.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
ASTAM functional prototypes of components	FY 2018 Q1	FY 2018 Q4
Develop STAMP Modernization Framework	FY 2018 Q1	FY 2018 Q2
Transition STAMP working prototype of modernized tools to the SWAMP	FY 2018 Q3	FY 2018 Q4
STAMP Scoring and Benchmark draft document	FY 2018 Q1	FY 2018 Q3
Transition of STAMP data set/test cases to SWAMP	FY 2018 Q2	FY 2018 Q3

Type of Research
Applied

Technical Readiness Level
TRL 5-6

Transition Plans

- The SWAMP has been set up as an enduring infrastructure resource for the cybersecurity research community and thus does not currently have a plan to transition.
- Resultant STAMP deliverables will be transitioned to the SWAMP and identified stakeholders including Software Assurance sub-IPT members, NIST, NSA Center for Assured Software and existing transition customers such as – banking/financial industry, Aberdeen Proven Grounds, Commonwealth of Pennsylvania, and open-source developer community.

Network System Security

- **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 and to develop robust metrics to determine the impact of cyber-attacks in a rapidly evolving environment. These resources include routing infrastructure, distributed denial of service defenses (DDoSD), and cloud-based systems.

- **Solution:** This program executes research in order to improve the multiple facets of network systems security. Effective network systems security needs to address multiple threats, provide a layered defensive approach and include both hardware and software solutions.

- **Impact:** The development and application of capabilities will better predict and defend against cyber-attacks on Federal Government installations and other critical infrastructure. This is accomplished at numerous points including DDoSD, routing infrastructure, and cloud-based systems.

Sub Projects

- Distributed Denial of Service Defense (DDoSD) - Distributed denial of service attacks are growing and frequently target critical infrastructure sectors and government agencies. The goal of the DDoSD project is to slow attack growth by promoting best practices and building technologies to mitigate new and current attack types. Through these strategies, critical infrastructure sectors and government agencies will have the ability to withstand one terabit per second attacks. This new level of defense will push the defender into the lead.

- Security of Cloud-Based Systems - The Security of Cloud-based Systems project is developing technologies that will help mitigate the security implications of cloud computing, as well as leverage the dynamic nature of the cloud to provide enhanced defense for operational environments.
- Secure Protocols for the Routing Infrastructure - Routing infrastructure is one of the most critical components of the Internet, yet it is susceptible to spoofing and other attacks in which cyber criminals can redirect users to unsafe websites or pathways. The Secure Protocols for the Routing Infrastructure project's goal is to add security to the Internet's core routing protocol, namely Border Gateway Protocol (BGP), so communications follow the intended path between organizations.
- Application of Network Measurement Science - This project involves strengthening the certificate authority system, securing embedded systems and detecting network outages in real time.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	-	16,567
Obligations	-	-	-	-	-

FY 2018 Key Milestone Events (Budget Year)

- Expand the system for protecting emergency management systems (e.g. 9-1-1 system) so that other critical call centers can also withstand large bursts of calls (e.g. Telephony Denial of Service attacks) and successfully pilot the technology in a critical call center.
- Develop tools and techniques for defending a medium scale Internet organization against 1 Terabit per second (1 Tbps) Denial of Service attack. At the project creation, 1Tbps attack far exceeded any attack that has occurred, but attackers are improving rapidly with attackers getting close to the 1 Tbps size. It is essential defenses be in place before attackers reach that scale.
- Integration of dynamic defense technology with command and control over multiple physical enclaves across multiple sites.
- Develop and deploy authentication services that validate certificates and address weaknesses in the Internet's current Certificate Authority authentication system.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Demonstrate defense against a 250 Mbps (1/4 Tbps) attack	FY 2017 Q2	FY 2018 Q1
Evalutation of TDoS defense pilot in a major data center	FY 2017 Q3	FY 2018 Q4
Demonstrate defense against a 750 Mbps (3/4 Tbps) attack	FY 2017 Q3	FY 2018 Q4
Delivery of FC2 Source Code and Executable Virtual Machines	FY 2017 Q2	FY 2018 Q2
SDNA Physical Enclave Setup Report	FY 2017 Q4	FY 2018 Q1
Demonstration of full SDNA-FC2 multi-site system	FY 2018 Q2	FY 2018 Q4
Develop certificate validation, certificate revocation, notary-based pinning, and TLS proxy inspection and authentication services to the Windows operating system	FY 2016 Q3	FY 2018 Q3

Type of Research
Developmental

Technical Readiness Level
TRL will vary between specific portfolio projects

Transition Plans
- The transition plan is multi-faceted with plans that are specific to each individual effort with final transitions to open source software, commercial licensing, and knowledge products.
- 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.

Mobile Security
- **Problem:** Threats to the government's use of mobile devices are real and exist across all elements of the mobile ecosystem. Many critical communication paths remain unprotected and leave the overall ecosystem vulnerable to attacks.

- **Solution:** The program will address the problems in securing the mobile ecosystem by taking a comprehensive R&D approach to securing the mobile ecosystem targeted toward architectural components and based on security capability gaps identified by HSE stakeholders.

- **Impact:** The program will facilitate a more secure mobile ecosystem not only for the Federal Government, but also for the commercial marketplace.

Sub Projects

- Mobile Device Security - Mobile technology has changed how people communicate, make daily decisions, and execute business transactions. However, the lack of security has prevented enterprise organizations from fully embracing mobile technology. The Mobile Device Security project is developing innovative security technologies to accelerate the secure adoption of mobility for mission use.
- Mobile Application Security - This project is developing innovative approaches to provide continuous automated assurance for security throughout a mobile application's lifecycle by monitoring commercial and federal threat intelligence sources, correlating vulnerabilities across app stores, responsibly sharing threat information, and developing methods to provide actionable information to developers or security analyst to address threats and vulnerabilities.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	-	5,211
Obligations	-	-	-	-	-

Milestones:

FY 2018 Planned Key Milestone Events (Budget Year)

- Transition mobile security technology in continuous authentication to the commercial marketplace.
- Demonstrate mobile application development tools with functionality that, transparently to the developer, incorporate secure mechanisms as mobile apps are developed.
- Demonstrate capabilities for validating security throughout a mobile application's operational use, as measured against the National Information Assurance Partnership (NIAP) criteria or other federal or commercial criteria.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Assessment and identification of NIAP criteria that can be automated	FY 2018 Q1	FY 2018 Q2
6 months Go/No-Go evaluations for Mobile Device Security R&D projects	FY 2018 Q2	FY 2018 Q4
6 months Go/No-Go evaluations for Mobile Application Security projects	FY 2018 Q2	FY 2018 Q4

Type of Research

Applied

Transition Plans

- All of the deliverables from this project will be openly available, either as commercial products, open source tools, or publicly available data sets. While the work of this program will benefit the entire HSE, the focus of the program is the Federal Government. In order to encourage transition into the Federal Government and DHS, promising solutions will be deployed to allow for hands on evaluation.

Human Aspects of Cybersecurity

- **Problem:** Improving cybersecurity requires investments in non-technical, social, economic and behavioral elements. The human user or operator is often a significant inherent vulnerability.

- **Solution:** Develop fundamentally different approaches to improve cybersecurity with activities focused on areas outside traditional approaches. Support research into the business, legal, technical, and behavioral aspects of the economics of cyber threats, vulnerabilities, and controls.

- **Impact:** By disrupting the status quo through radically different techniques, S&T will be able to address some of the most difficult cybersecurity issues. By facilitating value-based and more effective investments in cybersecurity, S&T will also improve value-based decision making by those who own, operate, protect, and regulate the Nation's vital data assets and critical infrastructure and will ultimately reduce the risks of cybercrime and cyberattacks.

Sub-Projects

- Cyber Risk Economics - Despite the growing national focus on cybersecurity, there has been little attention from the research community on economic, behavioral, and business factors that persuade a private organization to select and implement cybersecurity measures. The Cyber Economic Incentives project examines where, why, and how much cyber-infrastructure owners and operators should invest in cybersecurity. This project is researching adoption incentives, the reputations of commercial network operators for preventing attacks, and understanding criminal behaviors to mitigate risks.
- Insider Threat - Cybersecurity defenses most often focus on threats from outside an organization rather than threats posed by untrustworthy insiders even though insider threats frequently are the source of loss of financial or sensitive information and harm to critical infrastructure industries and national security. The Insider Threat project is developing approaches to detect and mitigate insider threats that will benefit a wide range of government and private-sector customers.
- Cybersecurity Metrics and Measurements - Developing meaningful cybersecurity metrics has been challenging, particularly as information technology and cyberattack methods change and evolve. This constantly changing environment makes it difficult for organizations to evaluate their cybersecurity defenses effectively. The project addresses this challenge by developing practical and useful decision aids and techniques that enable organizations to better gauge and measure their security posture and help users make informed decisions based on threats and cost.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	-	4,169
Obligations	-	-	-	-	-

FY 2018 Key Milestone Events (Budget Year)

- Complete operational pilot and assessment of insider threat detection tool with identified partner.
- Initial execution of Cyber Risk Economics R&D Strategy in the areas of Investment, Impact, Value and/or Incentives.
- Market analysis of cyber security economics gaps and needs.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Initiate 3 Cyber Risk Economics R&D projects	FY 2017 Q2	FY 2018 Q1
Complete development of pilot-ready insider threat detection tool	FY 2017 Q2	FY 2018 Q1
Convene Cyber Risk Economics R&D Stakeholder's Exchange Meeting	FY 2018 Q1	FY 2018 Q2

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. Due to the nature of the program focus, outcomes are applicable to all government and private sector agencies.

7. First Responder/Disaster Resilience – FY 2017 Annualized Continuing Resolution: $72.850M. FY 2018 Request: $61.294M. 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.

Bioagent Attack Resiliency – FY 2017 Annualized Continuing Resolution: $10.027M. FY 2018 Request: $5.000M. 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.

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 law enforcement 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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	4,000	6,500	6,500	5,682	0
Obligations	5,032	5,186	3,171	0	-

FY 2016 Key Milestone Events (Prior Year)

- 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 forensics investigations.

FY 2017 Key Milestone Events (Year of Execution)

- 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 law enforcement.
- 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 forensics investigations.

FY 2018 Key Milestone Events (Budget Year)

- N/A

Project Schedule

N/A

Type of Research

Applied

Technical Readiness Level

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

Transition Plans

- N/A

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 the Federal Bureau of Investigation 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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	5,875	6,500	6,500	6,715	0
Obligations	5,365	6,246	5,825	3,839	

FY 2016 Key Milestone Events (Prior Year)

- Provide 24/7 bioforensic casework support.
- Establish capability for the identification and characterization of rare variants and quasi species to support bioforensic casework

FY 2017 Key Milestone Events (Year of Execution)

- 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.

FY 2018 Key Milestone Events (Budget Year)

- N/A

Project Schedule

N/A

Type of Research
Development

Technical Readiness Level
The program plans to begin at TRL5 and at TRL7.

Transition Plans
N/A

Foreign Animal Disease Vaccines, Diagnostics, and Countermeasures

- **Problem:** The United States is at risk for outbreaks of high-priority foreign animal diseases (FADs) that would cause major economic disruption to the agriculture sector critical infrastructure resulting in billions of dollars of losses to U.S. livestock producers and the U.S. government. These diseases include Foot-and-Mouth Disease (FMD), Classical Swine Fever (CSF) and African Swine Fever (ASF) which may be introduced to the U.S. through natural, accidental or deliberate means.

- **Solution:** This project provides new, next-generation vaccines and other countermeasures to government and industry stakeholders to ensure that USDA and other first responders in the animal agriculture community, have the countermeasures needed to effectively identify, respond and recover from foreign animal 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 so that they are readily available in an outbreak situation.

- **Impact:** This project strengthens the defense of the U.S. agricultural infrastructure by ensuring that USDA and other first responders in the animal agriculture community, have effective countermeasures needed to respond to foreign animal disease outbreaks. Efforts to develop multi-serotype countermeasures are underway to provide faster and more comprehensive protection to limit the spread and size of an outbreak. Data from this project will support the regulatory licensing and/or availability of new countermeasures in the event of a high-consequence outbreak in the United States.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	14,125	12,300	13,800	15,496	0
Obligations	11,562	12,415	4,402	0	

FY 2016 Key Milestone Events (Prior Year)

- Obtain USDA CVB approval of up to 5 AdFMD master seeds for use in manufacturing of pre-licensing serials towards product licensure.
- Conclude assessment of broad spectrum countermeasure alternatives to address emerging disease threats.

FY 2017 Key Milestone Events (Year of Execution)

- Obtain USDA CVB Approval of at least two additional Adenovirus vectored foot-and-mouth disease virus vaccines for use in manufacturing of pre-licensing serials towards product licensure.
- Work with a U.S. animal health industry partner to transition two, next generation FMD monovalent vaccine candidates to late-stage product development.

FY 2018 Key Milestone Events (Budget Year)

- N/A

Project Schedule

N/A

Type of Research

Applied

Technical Readiness Level

This project funds the development of multiple vaccines, diagnostic assays, and molecular tools for new and more effective vaccines and diagnostics, the vast majority of which start at TRL3 and end at TRL7.

Transition Plans

N/A

USCG/EPA Wide Area/Vessel Decontamination Project

- **Problem:** The Environmental Protection Agency (EPA) along with S&T are looking for ways to improve capabilities for response to a wide area release of *Bacillus anthracis* spores. A long standing problem is the rapid ability to characterize contamination, conduct decontamination, and manage waste (including wash water).

- **Solution:** To develop decontamination procedures that would address fate and transport, including natural weathering, inform response and remediation decisions.

- **Impact:** Rapid and efficient recovery of metropolitan and coastal areas from a biological terrorist event.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	-	3,000
Obligations	-	-	-	-	-

FY 2018 Planned Key Milestone Events (Budget Year)

- Develop and determine wide area sample collection methods - determine appropriate environmental sample collection methods for outdoor matrices, including collection from concrete, pavement, dirt, air, water and vegetation and methods for sampling vehicles and large vessels.
- Understand wide area fate and transport to inform decision making - evaluate fate/transport/weathering of spores on various surfaces to inform mitigation and sampling strategies.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Task 1A – Develop and determine wide area sample collection methods - determine appropriate environmental sample collection methods for outdoor matrices, including collection from concrete, pavement, dirt, air, water and vegetation and methods for sampling vehicles and large vessels;	FY 2018 Q1	FY 2019 Q2

Task 1B – Understand wide area fate and transport to inform decision making - evaluate fate/transport/weathering of spores on various surfaces to inform mitigation and sampling strategies.	FY 2018 Q1	FY 2019 Q4

Type of Research

Applied

Technical Readiness Level

TRL 6-7

Transition Plans

Technology solutions and knowledge products, developed in accord with component requirements, will be transitioned to USCG and EPA for acquisition programs or preparedness planning.

Compact Personal Protective Equipment

- **Problem:** Law Enforcement VIP Protective Personnel lack an enhanced ability to discreetly carry personal protective equipment (PPE) for the protection and safe extraction of senior leadership and other designated persons from a full range of operational environments where a hazardous biological, chemical or radiological (CBR) substances has been released. The lack of this enhanced ability can prolong exposure to a respiratory threat due to the inaccessibility of PPE in an emergency situation.
- **Solution:** A compact, lightweight 'hooded escape respirator' that can be rapidly deployed and provide respiratory protection against hazardous CBR substances as well as providing for visual acuity and oral communications. The escape hood must be certified by the National Institute for Occupational Safety and Health (NIOSH) as protective against CBR contaminants. These escape hoods are designed for use only in emergency situations for rapid egress from CBR-containing environments of individuals under the protection of First Responders and Law Enforcement.
- **Impact:** Improvements in Protective Personnel technology will enable more compact, readily accessible, equipment suitable for tactical emergency response operations in a contaminated environment. Personnel charged with protection of VIPs will be better able to discreetly carry the full ensemble of equipment in support of their mission without a need in a time-critical situation to return to a designated location to retrieve the PPE. The PPE will find use within the tribal/local/State/federal Law Enforcement and First Responder communities.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	-	2,000
Obligations	-	-	-	-	-

FY 2018 Planned Key Milestone Events (Budget Year)

- Complete Materials Testing and Evaluation (MTE) on the selected PPE product.
- Complete Verification and Validation (V&V) with DHS component.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Materials Testing and Evaluation (MT&E) on the selected PPE product.	FY 2018 Q1	FY 2018 Q4
V&V completed.	FY 2018 Q2	FY 2018 Q4

Type of Research

Applied

Technical Readiness Level

TRL 6-7

Transition Plans

Hooded escape respirators developed with NIOSH-certification for use by First Responders and Law Enforcement Community members will be transitioned to DHs component(s) for operational deployment.

Chemical Attack Resiliency – FY 2017 Annualized Continuing Resolution: $2.000M. FY 2018 Request: $0. Provides advanced planning; develops CONOPS; develops and provides capabilities in forensics, laboratory response, personnel protection, and decontamination; and utilizes exercises and training for responding to and recovering from a chemical disaster.

Chemical Forensics

- **Problem:** There is a need to provide timely and comprehensive forensic support to investigations of chemical terrorist and criminal acts by collecting, preserving, analyzing, and matching chemical samples collected at scenes with samples obtained from people, places, and other events, as well as production sources. The Supreme Court has ruled that it must be demonstrated that chemical forensics and attribution findings are sufficiently reliable for admissibility in judicial proceedings.

- **Solution:** The Chemical Forensics project develops and maintains a robust and enduring national capability for the collection, preservation, and processing of chemical threat agents and associated evidence to provide comprehensive and timely forensic analysis and attribution. This project is incrementally developing and transitioning additional collection and preservation methods and devices, as well as expanded laboratory analytical methods to provide the capability to address the numerous chemical threat agents of interest in a prioritized manner.

- **Impact:** This project is providing law enforcement with the capability to promptly conduct chemical forensics analyses and attribute terrorist acts to their source, and thus providing highly valuable investigative leads that can identify perpetrators and prevent follow-on and copycat attacks.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	3,500	-	900	2,000	0
Obligations	3,216	3,635	2,615	0	-

Prior Year Key Events

- Published and transitioned to customers four Chemical Forensics Standard Methods for the collection or analysis of Chemical Threat Agents of interest.
- Submitted and published nine Chemical Forensics articles in relevant scientific journals.

Current Year Key Events

- Continued development, upgrading, and coordination with Chemical Agent Reactions Database (CARD) maintained by CSAC.
- Continued collaborative research project efforts (chemical warfare agent synthesis pathways and biotoxin studies) with Sweden

Budget Year Key Events
- N/A

Project Schedule Including Milestones
- N/A

Type of Research
Applied

Technical Readiness Level
The program plans to begin at TRL 3 and end at TRL 4

Transition Plans
Performers are strongly encouraged to publish the results of research efforts in a relevant scientific journal, if possible. Final reports and methods are provided directly to primary customer (FBI) and archived in Chemical Library maintained at Chemical Security Analysis Center, Aberdeen Proving Ground (APG), Maryland.

Explosives & Rad/Nuc Attack Resiliency – FY 2017 Annualized Continuing Resolution: $5.000M. FY 2018 Request: $0. 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.

Sub Project

- Use of Radar for Radiological Response: Research on how radar systems can track plume clouds for incident characterization.
- Organic Radiochromic Compounds (ORC) Development: Engineering and testing on ORCs sensitive to radiation for use on PPE and other responder equipment.
- Using Preventive Radiological/Nuclear Detection Equipment for Response & Recovery: Research and guidance for first responders on leveraging already existing equipment used for detection missions for consequence management missions.
- Enhanced Urban Dispersion Model: Expanded modeling capability to visualize and understand urban dispersion of radiological contaminants in major U.S. cities.
- Assessment of International Radiological/Nuclear Tools & Resources: Evaluations and focus group to determine IAEA tools and resources that are useful to U.S. responders.
- WEST Development and Use of Public Works Assets for Radiological Response: Improvements to the EPA's Waste Estimation Support Tool (WEST) to incentivize increased user base; research on using municipal equipment to manage radiological contamination.
- ROSS Resource Development: Advancements to the Radiological Operations Support Specialist (ROSS) program, which is a certification to provide health physics expertise to incident commanders during a radiological emergency.
- National Council on Radiation Protection and Measurements (NCRP) Guideline and Commentary Development: Development of specific guidelines and operational guidance for emergency dosimetry practices for response agencies.
- Rapid IND Hazard Tool Development: Provide a shelter-in place and evacuation zone identification tool for state and local emergency operations centers that is connected to federal modeling and decision support functions.
- Simulation and Modeling of RDD Detonation Response Actions: Develop simulations of immediate material disposition and first responder actions to better understand how to minimize radiation hazard to the public and maximize safety of response personnel.
- Expansion of Rad Responder Tool: Support FEMA by building out the capability of RadResponder, the nation’s radiological data sharing platform to include additional radiological response guidance, technical references, and tools.
- Distribute and support National Urban Security Technology Laboratory’s (NUSTL) Developed RDD Response Guidance: Provide technical support to city, state, and federal radiological response agencies as they incorporate science-based best practices into their response procedures, protocols, and plans.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	5,000	3,250	2,000	5,000	0
Obligations	4,226	2,923	1,622	834	

FY 2016 Key Milestone Events (Prior Year)

- 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.

FY 2017 Key Milestone Events (Year of Execution)

- 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.

FY 2018 Key Milestone Events (Budget Year)

- Test and evaluation of Rapid IND Hazard Tool for shelter-in-place and evacuation decision making, and documentation of lessons learned on additional technical and operational requirements from federal, state, and local users.
- Finalize and distribute technical guidance to first responders on how to use preventative radiological/nuclear detection equipment to perform consequence management operations.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
NCRP Report Draft Developed and Reviewed.	FY 2016 Q4	FY 2016 Q4
FY 2017		
Detection equipment CONOPS written and validated.	FY 2016 Q4	FY 2017 Q2

Research & Development Description	Plan Start Date	Planned Completion
Operational capability report on ORCs.	FY 2016 Q4	FY 2017 Q4
Focus group review of IAEA tools/guidance.	FY 2016 Q4	FY 2017 Q3
NCRP Report Published.	FY 2016 Q1	FY 2017 Q3
Study complete for radar application in fall-out tracking/modeling.	FY 2017 Q1	FY 2017 Q4
Recommendations for PRND equipment.	FY 2017 Q3	FY 2017 Q4
Urban Dispersion 3D Model demonstration.	FY 2016 Q2	FY 2017 Q4
FY 2018		
Rapid IND Hazard Tool Operational Requirements Documented.	FY 2017 Q3	FY 2018 Q1
Initiate Simulation and Modeling of RDD Detonation Response Actions.	FY 2017 Q3	FY 2018 Q1
Initiate Expansion of FEMA Rad Responder Tool.	FY 2018 Q1	FY 2018 Q2
Release and Distribute NUSTL Developed RDD Response Guidance.	FY 2018 Q1	FY 2018 Q1
Research on public works equipment for decontamination Published.	FY 2017 Q1	FY 2018 Q2
Prototype Software, content and usability improvements.	FY 2017 Q1	FY 2018 Q2
Completed model, user guide and distribute example products.	FY 2017 Q4	FY 2018 Q4
Finalize report on IAEA products, tools, and responder feedback.	FY 2017 Q4	FY 2018 Q1
Transition PRND validated CONOPS to DNDO and responders.	FY 2018 Q1	FY 2018 Q4
Transition to FEMA improved ROSS tools and training.	FY 2018 Q1	FY 2018 Q4

Type of Research

Developmental

Technical Readiness Level

The TRL of the Rad/Nuc Response and Recovery program varies between specific projects. Some exploratory research is at a TRL of 3 to 5, but the majority of portfolio projects in support of FEMA and first responders are TRL 7 or higher.

Transition Plans

- Leverage existing radiological training and preparedness organizations to assist in distributing and integrating developed technology and knowledge products into State/local radiological /nuclear preparedness and response activities:
    - Conference of Radiation Control Program Directors (CRCPD)
    - National Council on Radiation Protection and Measurements (NCRP)
    - DOE National Laboratories
    - FEMA Center for Domestic Preparedness
    - DOE CTOS - Center for Radiological/Nuclear Training at Nevada Test Site
    - Defense Threat Reduction Agency
    - Domestic Nuclear Detection Office (DNDO)
- 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 Bureau – Civil Support Teams (CST)
    - Interagency Modeling and Atmospheric Assessment Center (IMAAC)
    - Department of Energy – Federal Radiological Monitoring and Assessment Center (FRMAC)
    - Department of Energy – Radiological Assistance Program (RAP)

First Responder Capability – FY 2017 Annualized Continuing Resolution: $20.250M. FY 2018 Request: $17.750M. 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. In addition, commercializing technology that fully meet these challenges is typically a lengthy process. Developing near term innovative technologies that address high priority capability gaps identified by Federal, State, local, and tribal first responders is critical to ensure their safety, performance and well-being.

- **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 save lives through the increased availability and reliability of technology for first responders.

Sub Project

- Wildland Fire Respiratory Protection: A new low profile, lightweight piece of equipment that reduces the weight a firefighter has to carry and allows for a wider range of motion.
- Emergency Vehicle to Civilian Vehicle Early Warning System: A notification system that provides civilian vehicles warning of a nearby responding emergency vehicle.
- Emergency Vehicle to Emergency Vehicle Early Warning System: A notification system that provides other emergency vehicles warning of an active emergency vehicle traveling within their proximity.
- Multi-Mission Disrupter: An agile light-weight disrupter system that can be easily assembled to support bomb squads in multiple operations such as land or water environments.
- Multimeter Wire Attack Kit: A tool that combines the functions of a multimeter with a wire attack kit into one device in order to conduct electronic diagnostics of detonator wires and switches.
- Rescue Hoist Protective Glove: A proposed new glove made of advanced materials or replaceable/attachments that assists with increasing the duration of gloves used in rescue hoisting operations.
- First Responder Routing Logic Guide: Emergency responder routing system that informs responders of upcoming road and traffic conditions and can suggest alternate routes to safely navigate their vehicles.
- Integration of Public Data Feeds: A platform that provides first responders with a single stream of eyewitness, social media, and open source data and shared information feeds.
- 3D Indoor Dynamic Mapping and Visualization: Technology that provides real-time 3D mapping and visualization scanning within a multi-story building under hazardous conditions.
- Energy Harvesting Fabrics: Energy-harvesting, smart fabric incorporated into first responder uniforms that either powers electronics or a daily uniform.
- Responder Technology Alliance: Characterizes future challenges and opportunities within the next 15 years while proposing new and innovative solutions.
- Response and Defeat Operations Support (REDOPS): Establishes a systems analysis approach involving explosives countermeasures experts from all levels of government and direct Research, Development, Testing & Evaluation (RDT&E) of technologies needed by state and local bomb squads (SLBS).

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	7,978	11,400	14,300	15,000	15,000
Obligations	6,678	10,304	11,057	1,937	

FY 2016 Key Milestone Events (Prior Year)

- Developed a multi threat base ensemble/duty uniform that provides enhanced splash, puncture, and thermal protection.
- Tested and transitioned Special Purpose Low Impact Threat Rupture system, a render safe technology for improvised explosive devices that is used by SLBS.

FY 2017 Key Milestone Events (Year of Execution)

- Make contract awards for the development of technologies that address the high priority needs identified by first responders.
- Transition eleven first responder technologies/knowledge products developed by S&T's FRG.

FY 2018 Key Milestone Events (Budget Year)

- Make contract awards for the development of technologies that address the high priority needs identified by first responders.
- Transition and commercialize first responder technologies developed by S&T's FRG.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Prototyping of Personal Protective Equipment (NC State and LUNA).	FY 2015	FY 2016
Prototyping of Smoke Resistant Turnout Gear.	FY 2015	FY 2016
Test documents and protocols developed to be incorporated into ambulance standards.	FY 2015	FY 2016
Design period begins for the Body Worn Camera project.	FY 2016 Q3	FY 2017 Q4
Prototyping of the Precision Outdoor and Indoor Navigation and Tracking for Emergency Responders (POINTER) project.	FY 2015 Q2	FY 2018 Q2

Research & Development Description	Plan Start Date	Planned Completion
Operational Field Assessments of the X-Ray Rover.	FY 2016 Q3	FY 2016 Q3
Beginning of Automated Driver and Responder Alert System (ADRAS) project.	FY 2016 Q4	FY 2017 Q2
Prototyping and OFA of Physiological and Environmental Monitoring (WiPEM) project.	FY 2015 Q3	FY 2017 Q2
Prototype for Enhanced Dynamic Geo-Social Enviornment (EDGE) School.	FY 2016 Q2	FY 2017 Q2
Conduct four REDOPS operational assessments.	FY 2016 Q1	FY 2017 Q1
Transition two Counter-IED tools to public safety bomb technicians.	FY 2016 Q4	FY 2017 Q1
FY 2017		
Transition of the Personal Protective Equipment (NC State and LUNA).	FY 2017 Q3	FY 2017 Q3
Transition of the X-Ray Rover.	FY 2017 Q3	FY 2017 Q1
Continuing prototype testing of the Smoke Resistant Turnout Gear.	FY 2017 Q3	FY 2018 Q2
Transition of Ambulance Standards .	FY 2017 Q3	FY 2017 Q2
Continuing of prototyping for Indoor Navigation and Tracking for Emergency Responders (POINTER) project.	FY 2017 Q3	FY 2018 Q2
Design and Prototyping of the Respiratory Protection equipment.	FY 2017 Q3	FY 2018 Q2
Prototyping performed for the Body Worn Camera project.	FY 2017 Q3	FY 2018 Q2
Prototyping for Automated Driver and Responder Alert System (ADRAS) project.	FY 2017 Q3	FY 2018 Q2
Transition of Wireless Physiological and Environmental Monitoring (WiPEM) project.	FY 2017 Q3	FY 2017 Q3
Transition of Enhanced Dynamic Geo-Social Enviornment (EDGE) School.	FY 2017 Q3	FY 2018 Q1
Begin design of Emergency Vehicle to Civilian Vehicle Early Warrning System.	FY 2017 Q3	FY 2018 Q3
Begin design of Wildland Fire Respiratory Protection.	FY 2017 Q3	FY 2018 Q3

Research & Development Description	Plan Start Date	Planned Completion
Begin design of Emergency Vehicle to Emergency Vehicle Early Warning System.	FY 2017 Q3	FY 2018 Q3
Begin design of Multi-Mission Disrupter.	FY 2017 Q3	FY 2018 Q3
Begin design of Multimeter Wire Attack Kit.	FY 2017 Q3	FY 2018 Q3
Begin design of Rescue Hoist Protective Glove.	FY 2017 Q3	FY 2018 Q3
Begin design of First Responder Routing Logic Guide.	FY 2017 Q3	FY 2018 Q3
Begin design of Integration of Public Data Feeds.	FY 2017 Q3	FY 2018 Q3
Begin design of 3D Indoor Dynamic Mapping and Visualization.	FY 2017 Q3	FY 2018 Q3
Begin design of Energy Harvesting Fabrics.	FY 2017 Q3	FY 2018 Q3
Conduct four REDOPS operational assessments.	FY 2017 Q1	FY 2018 Q1
Transition two Counter-IED tools to public safety bomb technicians.	FY 2017 Q4	FY 2017 Q4
FY 2018		
Perform OFA and Transition of the Body Warn Camera project.	FY 2018 Q3	FY 2018 Q3
Transition of Smoke Resistant Turnout Gear.	FY 2018 Q3	FY 2018 Q3
Transition of Respiratory Protection project.	FY 2018 Q3	FY 2018 Q3
Transition of Automated Driver and Responder Alert System (ADRAS) project.	FY 2018 Q3	FY 2018 Q4
Transition of the Indoor Navigation and Tracking for Emergency Responders (POINTER) project.	FY 2018 Q4	FY 2018 Q4
Begin design of Emergency Vehicle to Civilian Vehicle Early Warrning System.	FY 2018 Q3	FY 2018 Q3
Begin design of Wildland Fire Respiratory Protection.	FY 2018 Q3	FY 2018 Q3
Begin design of Emergency Vehicle to Emergency Vehicle Early Warning System.	FY 2018 Q3	FY 2018 Q3
Develop a Prototype of Multi-Mission Disrupter.	FY 2018 Q3	FY 2018 Q3
Develop a Prototype of Multimeter Wire Attack Kit.	FY 2018 Q3	FY 2018 Q3

Research & Development Description	Plan Start Date	Planned Completion
Develop a Prototype of Rescue Hoist Protective Glove.	FY 2018 Q3	FY 2018 Q3
Develop a Prototype of First Responder Routing Logic Guide.	FY 2018 Q3	FY 2018 Q3
Develop a Prototype of Integration of Public Data Feeds.	FY 2018 Q3	FY 2018 Q3
Develop a Prototype of 3D Indoor Dynamic Mapping and Visualization.	FY 2018 Q3	FY 2018 Q3
Develop a Prototype of Energy Harvesting Fabrics.	FY 2018 Q3	FY 2018 Q3

Type of Research

Developmental

Technical Readiness Level

The program plans begin at TRL 3 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 FRG works with the vendor at the onset of a project to develop a commercialization plan that requires the vendor to 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 to gather necessary information for its program and to keep those communities informed about the technologies and knowledge products S&T is developing on their behalf.
- **Solution:** A three-pronged communications effort that includes: a website platform to provide the first responder community with information about federal resources on products, standards, testing and evaluation, grants and training, and best practices to develop or deploy technologies to enhance homeland security; a collaboration platform for sharing of documents and best practices; and overall outreach and stakeholder engagement that includes conferences, via social media, and more.

- **Impact:** The Tech Clearinghouse increases first responder awareness of the S&T's work, facilitates the flow of important information throughout the emergency response community, and enables S&T to design and manage projects that truly meet

its mission. It is a cost-effective, multi-faceted communications effort that expands S&T's reach into stakeholder communities, and enables the first responder community to make better informed purchasing decisions.

Sub Project

- FirstResponder.gov (now known as scitech.dhs.gov/first-responders): FirstResponder.gov has transitioned to scitech.dhs.gov/first-responders, and remains a key web-based resource that enables federal, state, local, tribal, and territorial first responders to easily access and leverage federal resources on products, standards, testing and evaluation, grants and training, and best practices to develop or deploy technologies to enhance homeland security. The website provides original content through Responder News articles and videos, which highlight federal programs, initiatives, webinars, and research. The scitech.dhs.gov/first-responders site also provides a user feedback mechanism via email at: first.responder@hq.dhs.gov, and opportunities to engage via DHS social media platforms linked to the site (Facebook, Twitter, Flickr, and Instagram). Visit scitech.dhs.gov/first-responders.
- First Responder Communities of Practice: 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.
- Outreach and Stakeholder 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.

Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	2,000	5,000	4,000	4,250	2,750
Obligations	934	2,851	3,423	1,863	-

FY 2016 Key Milestone Events (Prior Year)

Initiate transition of 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.

Enhance and expand FRG presence on current and future social media (i.e., Facebook, Twitter, YouTube, Instagram, etc.) and produce project-based videos targeted to the first responder community with the intent of increasing traffic to FirstResponder.gov.

FY 2017 Key Milestone Events (Year of Execution)

Complete the transition the FirstResponder.gov website to scitech.dhs.gov/first-responders to comply with the requirement to consolidate the number of DHS related websites.

Develop and expand FRG presence on current and future social media pages (i.e., Facebook, Twitter, YouTube, Instagram, etc.) to increase traffic to First Responder content on scitech.dhs.gov/first-responders and providing information tailored for the first responder community.

FY 2018 Key Milestone Events (Budget Year)

Produce project-based videos targeted to the first responder community, and publish them on scitech.dhs.gov/first-responders to inform them of progress and status and/or how to engage with S&T/FRG.

Assess the current software platform and transition the First Responder Communities of Practice collaboration site to comply with the requirement to consolidate the number of DHS related websites.

Project Schedule

Research & Development Description – Tech Clearinghouse	Plan Start Date	Planned Completion
FY 2016		
Initiate the 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 Q1	FY 2016 Q4
Enhance and expand 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	FY 2016 Q1	FY 2016 Q4
Conduct outreach to the first responder community by interacting with professional homeland security, public safety, responder, and criminal justice associations such as the IAB, NPSTC, IACP, IAFC, APCO, IAEM, etc.	FY 2016 Q1	FY 2016 Q4
FY 2017		
Complete the transition from 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 2017 Q1	FY 2017 Q2
Initiate the transition of First Responder Communities of Practice to the DHS S&T EVMII to comply with the requirement to consolidate the number	FY 2017 Q2	FY 2017 Q4

Research & Development Description – Tech Clearinghouse	Plan Start Date	Planned Completion
of DHS related websites.		
Conduct outreach to the first responder community by interacting with professional homeland security, public safety, responder, and criminal justice associations such as the IAB, NPSTC, IACP, IAFC, APCO, IAEM, etc.	FY 2017 Q1	FY 2017 Q4
Update **scitech.dhs.gov/first-responders** with relevant content, including internal and external information on first responder related projects/programs and increase usage by first responders via marketing.	FY 2017 Q1	FY 2017 Q4
FY 2018		
Update **scitech.dhs.gov/first-responders** with relevant content, including internal and external information on first responder related projects/programs and increase usage by first responders via marketing.	FY 2018 Q1	FY 2018 Q4
Conduct outreach to the first responder community by interacting with professional homeland security, public safety, responder, and criminal justice associations such as the IAB, NPSTC, IACP, IAFC, APCO, IAEM, etc.	FY 2016 Q1	FY 2016 Q4

Type of Research
N/A

Technical Readiness Level
N/A

Transition Plan
N/A

Information Sharing and Interoperability – FY 2017 Annualized Continuing Resolution: $10.967M. FY 2018 Request: $11.911M. 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.

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 situational awareness 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.

Sub Project

- Smart City Functionality Framework – define and develop the HSE functionality framework for an interoperable Smart City.
- IoT Sensor Integration – design, develop and transition IoT sensors using open-standards for First Responder situational awareness.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	2,000	3,000	4,000	4,206	6,211
Obligations	6,343	2,553	3,360	0	-

FY 2016 Key Milestone Events (Prior Year)

- Performed 2 IoT sensor open standard integration spiral/demonstrations for interoperable sensors and communications.
- Integrated IoT Low-Cost Flood Inundation Sensor prototype development with Smart Alert Engine (SALE) for Smart City technical feasibility prototype.
- Developed 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 2017 Key Milestone Events (Year of Execution)

- Develop and deploy 300 IoT Flood Sensors to refine sensor functionality in operational flood environment for Smart Alert Engine test and evaluation.
- Assess and design IoT Intelligent Building Infrastructure sensors and building codes for 3-D imaging, imagery and motion detection.

FY 2018 Key Milestone Events (Budget Year)

- Initiate/originate an AWN message from a sensor (environment) into the FEMA IPAWS Test and Development Lab (TDL).
- Assess and design Unmanned Aerial Systems (UAS) as a delivery platform for IoT sensors for mass transit tunnel search & reconnaissance.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Performed 2 IoT sensor open standard integration spiral/demonstrations for interoperable sensors and communications.	FY 2016 Q1	FY 2016 Q4
Integrated IoT Low-Cost Flood Inundation Sensor prototype development with SALE for Smart City technical feasibility prototype.	FY 2016 Q2	FY 2017 Q1
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 2017 Q1	FY 2017 Q2
FY 2017		
Develop proof of concept for IoT Low-Cost Flood Inundation Sensor.	FY 2016 Q3	FY 2017 Q1
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 Q2	FY 2017 Q4
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 Q1	FY 2017 Q4
Assess and design IoT Intelligent Building Infrastructure sensors and building codes for 3-D imaging, imagery and motion detection.	FY 2017 Q2	FY 2017 Q4

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Develop and deploy 300 IoT Flood Sensors to refine sensor functionality in operational flood environment for Smart Alert Engine test and evaluation.	FY 2017 Q3	FY 2018 Q2
Initiate/originate an AWN message from a sensor (environment) into the FEMA IPAWS Test and Development Lab (TDL).	FY 2018 Q1	FY 2018 Q3
Assess and design Unmanned Aerial Systems (UAS) as a delivery platform for IoT sensors for mass transit tunnel search & reconnaissance.	FY 2017 Q3	FY 2018 Q3
Develop prototype of Smart Alert Engine (Flood Alert) test and evaluation that is complementary to IoT Flood Sensors.	FY 2017 Q3	FY 2018 Q2

Type of Research

Developmental

Technical Readiness Level

TRL 3 – 7

Transition Plans

- IoT Flood Sensor transitions includes SBIR Phase 2 - commercialization plan focuses upon; water authorities, precision agriculture, alerting services, grants (FEMA, DOA, FIMA, etc.), government entities (NOAA, USGS, US ACE) and other market segments.
- SALE for Smart City technical feasibility prototype – Long Range Broad Area Announcement Phase 2 includes commercialization plan to be developed. The SALE initiative will have a prototype development effort in year 2 with a usage and transition plan as part of the scope of work.
- Next Generation Incident Command System – has been successfully transitioned to the State of California; Emergency Management Victoria, Australia; Worldwide Incident Command (WICS) not-for-profit; and to the GitHub open-source code repository for open access and download.
- Smart City / IoT sensor development will work with stakeholder partners (e.g. Boston Fire Department, National Institute of Building Standards, Government Service Administration, etc.) and other as part of the requirements, design, test and evaluation prior to a commercial transition.

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.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	2,000	0	3,000	1,504	0
Obligations	6,343	2,553	3,360	0	-

Prior Year Key Events
- Reconvened the P25 CAP Advisory Panel (formerly known as Governing Board) under the existing Charter.
- Updated the P25 CAP Advisory Panel (formerly known as Governing Board) Charter.
- Drafted Local Control Requirements document.
- Added P25 Common Air Interface Conventional Interoperability Tests to the program.

Current 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.

Budget Year Key Events
- N/A

Project Schedule including Milestones

- N/A

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.

- **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.

Sub Project
- Datacasting - Performs technical and operational evaluations of datacasting as a telecommunications capability in support of public safety. Datacasting is using existing broadcast television signals to deliver encrypted, targeted public safety video and data.
- Video Quality in Public Safety - Develops assessment tools and guidance documents that enable first responder agencies to purchase and deploy appropriate video technology to meet their operational needs.

- Video Analytics – Develops a public safety video analytics Community of Interest, develops R&D, Standards, and Collaboration priorities and strategy, as well as develops initial research in content- based video quality measurement (CBVQM).
- Demo Network – Deployables - Examines ways in which first responders could access and communicate critical information during incidents that arise in areas that are not served or are under-served by the fixed Nationwide Public Safety Broadband Network or alternative access networks, such as commercial carriers or public Wi-Fi.
- Demo Network – Indoor- Provides procedures and techniques to both quantify and improve in-building performance and coverage for band class 14 LTE Systems.
- Voice Intelligibility Testing over Long-Term Evolution (LTE) - Tests and identifies speech codecs (the systems that encode and decode voice data) to provide responders with a reliable system that maintains a high-level of intelligibility in even the most difficult noise environments.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	8,500	5,338	4,000	4,206	5,700
Obligations	6.469	5,499	4,021	0	-

FY 2016 Key Milestone Events (Prior Year)

- Conduct field demonstrations for one wireless broadband technology demonstrator solutions.
- Contribute results to 3rd Generation Partnership Project (3GPP) Release 13 & 14.

FY 2017 Key Milestone Events (Year of Execution)

- 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.
- Test and evaluate at least one deployed capability in a communications-challenged environment.

FY 2018 Key Milestone Events (Budget Year)

- Assist with the rollout of a nationwide datacasting system and develop technical enhancements to the system.
- Formulate test system architecture and build use cases for speech quality and intelligibility testing of LTE voice communications.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Conduct field demonstrations for one wireless broadband technology demonstrator solutions.	FY 2016 Q1	FY 2016 Q4
Conduct tabletop exercise for two wireless broadband technology demonstrator solutions.	FY 2016 Q1	FY 2016 Q4
Create extended simulation models to support additional PROSE functionality.	FY 2016 Q1	FY 2016 Q1
Contribute results to 3GPP Release 13 & 14.	FY 2016 Q1	FY 2016 Q3
Publish results in professional conference proceedings and journals.	FY 2016 Q1	FY 2016 Q2
FY 2017		
Identify and prioritize user challenges and requirements with the first responder community.	FY 2017 Q1	FY 2017 Q3
Develop realistic network simulation tools and interference models for cellular network planning.	FY 2017 Q1	FY 2017 Q3
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 Q1	FY 2017 Q3
Publish test results and/or knowledge products to better inform stakeholders about the state of the art technologies.	FY 2017 Q1	FY2017 Q3
Develop field measurement method by which public safety can evaluate indoor broadband coverage in Band Class 14.	FY 2017 Q1	FY 2017 Q2
FY 2018		
Assist with the rollout of a nationwide datacasting system and develop technical enhancements to the system.	FY 2018 Q1	FY 2018 Q4
Provide technical subject matter expertise for the APEX program by conducting R&D, demonstrations, and technical tests and evaluations.	FY 2018 Q1	FY 2018 Q3
Formulate test system architecture and build use cases for speech quality and intelligibility testing of LTE voice communications.	FY 2018 Q1	FY 2018 Q3
Configure in-house load tester and build an LTE system to execute speech quality and intelligibility of LTE voice communications tests.	FY 2018 Q1	FY 2018 Q4
Evaluate public safety oriented data against baseline performance measurements from year 1 speech analytic research.	FY 2018 Q1	FY 2018 Q4

Research & Development Description	Plan Start Date	Planned Completion
Develop first iteration of future video analytics R&D interoperability testbed.	FY2018 Q1	FY 2018 Q3

Type of Research
Developmental

Technical Readiness Level
TRL levels vary across each sub-project within wireless communications. As a whole wireless communications includes efforts that begin as early as TRL 2 and will be carried through to TRL 7.

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.
- Publish a lessons learned document on public safety broadband performance and impacts after operational test and evaluation.

Natural Disaster Resiliency – FY 2017 Annualized Continuing Resolution: $16.302M. FY 2018 Request: $26.634M. 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 Systems (formerly 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). Advances in networking, computing, sensing, and control systems have enabled a broad range of new applications. Device manufactures and operators are increasingly seeing the potential of adding computational power and network connectivity to a wide range of devices, known as the IoT. As the IoT continues to expand, the need to be able to quickly integrate IoT devices and sensors into legacy enterprise systems and networks is becoming critical. Securing these devices is necessary to ensure safe operational use while minimizing the risks and vulnerabilities. Increasing reliance on automated cyber systems creates the potential for unintentional

design and implementation errors as well as intentional cyber-attacks. This requires a combination of industry innovation, fundamental science, and crucially cross-cutting applied research.

- **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 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. 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.

Sub Projects

- Cyber Physical Systems Security – This project is looking at the systems which are often a source of competitive advantage in today's innovation economy, but also increase cyber security risks and attack surfaces. The consequences of unintentional faults or malicious attacks could have severe impact on human lives and the environment.
- Cyber-Enabled Networked Physical Systems - CPS and IoT are designed with computation and communication, including machine-to-machine communication capabilities. This has resulted in new cyber security challenges and the risks only increase as CPS/IoT systems are scaled and designed to work in autonomous situations. This applied research will address issues in security, trust, context-awareness, ambient intelligence, and reliability issues.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	8,242	3,500	7,750	6,165	4,167
Obligations	6,191	5,915	7,040	7,040	-

FY 2016 Key Milestone Events (Prior Year)

- 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.

FY 2017 Key Milestone Events (Year of Execution)

- 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.
- Conduct threat assessment and best practice recommendation for building control security.

FY 2018 Key Milestone Events (Budget Year)

- Develop and deploy Medical Device Risk Assessment Platform.
- Develop a system for securely updating the electronic control unit in automobiles and implement the system in two or more tier one automotive suppliers.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Established a pre-competitive research consortium.	FY 2015 Q4	FY 2017 Q1
Established an industry group dedicated to developing secure update standards.	FY 2015 Q4	FY 2016 Q3
FY 2017		
Academic and industry team provided draft best practices for building control security.	FY 2016 Q3	FY 2017 Q2
FY 2018		
Evaluate the risk assessment platform using data from at least one major hospital chain.	FY 2017 Q2	FY 2018 Q2
Pilot the risk assesment platform at two or more hospital chains.	FY 2017 Q4	FY 2018 Q4
Release a design requirements document for securely updating automobiles.	FY 2017 Q1	FY 2018 Q1
Work with at least two auto manufacturers to implment and pilot the system.	FY 2018 Q1	FY 2018 Q1

Type of Research
Developmental

Technical Readiness Level
TRL will vary between specific portfolio projects.

Transition Plans
- Solutions will be developed that are practical and ready to be deployed at full operating capability.
- Beta testing and evaluation opportunities will be investigated and determined early on and agreements will be made with partners for such.

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 identify GPS interference vulnerabilities (intentional and unintentional) and educate critical infrastructure owners and operators enabling them 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 Position Navigation and Timing (PNT) solutions to meet critical infrastructure needs.

Sub Project

- Commercial GPS Receiver Performance Characterization: Test commonly used GPS receivers in critical infrastructure to identify their performance characteristics and vulnerabilities.
- PNT Requirements for Critical Infrastructure: In collaboration with National Protection and Programs Directorate's (NPPD) Office of Infrastructure Protection (IP), define and validate PNT requirements for the critical infrastructure sectors through outreach to subject matter experts and critical infrastructure end-users.
- PNT Enhancements: Develop specific mitigation techniques and technologies that can be transitioned to the private sector to protect critical infrastructure against GPS/GNSS interference. This includes development of a low-cost anti-jam antenna for fixed infrastructure.
- Assured Timing Iridium Precision Time Base for Critical Infrastructure Applications: Develop a complementary timing technology using Iridium satellites as a source of time. Due to the lower orbit of Iridium satellites, their signals are 1,000 times stronger than GPS signals, making them more difficult to jam and spoof.

- Multi-GNSS Evaluation: Understand the implications of using multi-GNSS enabled receivers on critical infrastructure.
- System-Level Testing: Perform system-level testing to understand the impact of timing disruptions on critical infrastructure.
- Timing Manipulation Detection Capabilities: Develop capabilities to detect GPS timing signal interference that can be easily integrated into critical infrastructure and/or utilizes existing critical infrastructure assets, sensors, or networks.
- Assured Timing Technologies: Develop complementary timing technologies that are robust, low-cost, easily integrated into existing critical infrastructure operations, and provides comparable or better timing performance as GPS.
- GPS and RF Interference Detection: Develop real-time monitoring technology that can detect, identify, and locate radiofrequency (RF) interference events in a way that is low-cost and utilizes existing infrastructure assets and sensors.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	1,000	6,702	10,830
Obligations	-	-	-	-	-

FY 2016 Key Milestone Events (Prior Year)

- Transition intellectual property and/or transition paths for commercialization of new equipment or other mitigation solutions and best practices.
- 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 2017 Key Milestone Events (Year of Execution)

- Coordinate with private sector GPS user equipment manufacturers and vendors to recommend mitigations and/or upgrades to next-generation products and production lines.
- Conduct open-air GPS testing on receivers and mitigation equipment or solutions (to include techniques, tactics, and procedures) to validate laboratory results.

FY 2018 Key Milestone Events (Budget Year)

- Host open-air GPS test event for industry as part of outreach efforts with GPS equipment manufacturers and critical infrastructure end-users.
- Project Initiation: GPS and RF Interference Detection.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
eLoran demonstration at the New York Stock Exchange.	FY 2016 Q1	FY 2016 Q3
Initial classified outreach meetings with a GPS receiver manufacturer to discuss S&T's GPS receiver vulnerability test results.	FY 2016 Q1	FY 2016 Q3
PNT program participation in the 2016 FRG Electronic Jamming Exercise to validate laboratory test results of GPS vulnerabilities in a live-sky jamming and spoofing environment.	FY 2016 Q4	FY 2016 Q4
Release best practices guidance.	FY 2016 Q1	FY 2016 Q4
FY 2017		
Host open-air GPS and Iridium test event at Savannah River Site to test capability of Iridium receivers to provide timing information in GPS denied environment.	FY 2016 Q4	FY 2017 Q1
Host open-air GPS spoofing test event for GPS equipment manufacturers.	FY 2017 Q2	FY 2017 Q4
Final draft timing requirements report for the electricity subsector and wireless communications sector.	FY 2016 Q4	FY 2017 Q1
Final draft timing requirements report for the financial services and emergency services sectors.	FY 2017 Q1	FY 2017 Q3
Project initiation: Multi-GNSS Evaluation.	FY 2017 Q2	FY 2017 Q2
Project Initiation: System-Level Testing.	FY 2017 Q2	FY 2017 Q3
Project Initiation: Timing Manipulation Detection Capabilities.	FY 2017 Q2	FY 2017 Q3
Project Initiation: Assured Timing Technologies.	FY 2017 Q3	FY 2017 Q4
FY 2018		

Research & Development Description	Plan Start Date	Planned Completion
Project Initiation: GPS and RF Interference Detection.	FY 2018 Q1	FY 2018 Q3
Host open-air GPS test event for testing of mitigation technologies or revised equipment from manufacturers.	FY 2018 Q2	FY 2019 Q1

Type of Research
Developmental

Technical Readiness Level
TRL varies 4-7. 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.

National Hurricane Technology
- **Problem:** FEMA's National Hurricane Program's (NHP) current system relies upon legacy systems and requires too many resources and too much time to provide timely and actionable results. The most significant challenges are to understand the potential impacts of storm surge, winds, and inland flooding and the level of uncertainty of these forecasts as storms approach. Planning and training often use different sets of tools that cause challenges in translating plans and training into action during real life events. Once evacuation decisions are made, the challenge becomes alerting the public whom often are not aware that they are in a hazard zone or what they should do. After an event, the process of understanding lessons-learned requires a lengthy and cumbersome review process that faces significant issues in gathering accurate and timely critical data.

- **Solution:** S&T is working across multiple agencies including FEMA, USGS, NOAA and State, local and tribal communities to create an integrated platform that meets the needs of the entire hurricane response community. Previous work has culminated in a prototype decision support tool (HVX) that provides enhanced data analytics for impact and uncertainty assessments, integrated training with simulated scenarios to enable serious gaming for improved training compliance, and planning tools to

streamline pre-planning of evacuation zones and routes. Funds for FY18 support the transition of this prototype tool to a private vendor to enable fulltime support and operations through a FEMA RFP. In addition, user feedback indicates that both the evacuation alert and resource planning extensions piloted in FY 2017 should be integrated into HVX. And that further work needs to be done to add newly developed products for inland flooding impacts and to extend HVX more fully into post-storm assessment.

- **Impact:** The modernized NHP will enhance the ability of the end users at the state and local level in managing local hurricane evacuations and response. Successful transition of HVX will allow FEMA to eliminate legacy systems and integrated training will enable the delivery of training to all users at reduced cost. Improvements for evacuation alerting, resource planning and inland flooding products will improve evacuation effectiveness and automated post-storm assessment capture and reporting will reduce paperwork and increase the timeliness of these critical reports.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	1,000	1,000	1,000	1,000
Obligations	-	1,671	917	917	-

FY 2016 Key Milestone Events (Prior Year)

- Guidance document of best practices for hurricane evacuations.
- Pilot products for integrated training, hurricane evacuation study modularization.

FY 2017 Key Milestone Events (Year of Execution)

- Deployment of functional prototype for operations during 2017 Hurricane season (May).
- Pilot products for evacuation alerting, resource allocation, and post-storm assessment.

FY 2018 Key Milestone Events (Budget Year)

- Create prototype post-storm assessment products.
- Integrate evacuation alert pilot application (I-PAWS and current research).
- Enhance inland flooding impact products based on Hurricane Matthew experience.
- Support for transition of HVX to private O&M provider.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Technology pilots to improve the quality and speed of impact capture.	FY 2018 Q2	FY 2018 Q4
Full integration of evacuation alert application	FY 2018 Q1	FY 2018 Q4
Enhanced inland flooding impact products	FY 2018 Q2	FY 2018 Q4
HVX transition assistance	FY 2018 Q1	FY 2018 Q4

Type of Research
Applied research.

Technical Readiness Level
TRL-5

Transition Plans
FEMA is issuing an RFP for transition and operations and maintenance of the current HVX platform (expected spring 2017).

Regional Resilience Assessment Technology Modernization
- **Problem:** The United States is being increasingly impacted by disasters of all types - natural, technological and man-made. Existing science and technologies available at the Federal, state and community levels are not adequate to meet the challenges of assessing the multiple risks and hazards effectively and efficiently. This negatively impacts the ability of organizations to spend mitigation funds effectively to reduce risks, and to respond and recover from disasters of all types. New science and technology is required to fully meet the goals of PPD-21, which defines resilience "as the ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions." Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents.

- **Solution:** FRG will work with key stakeholders at Federal, state and local levels to understand and prioritize gaps in science and technology needed to increase resiliency at all levels of government. Coordinate with the research community, industry and other practitioners to identify, develop, test and transition to operational use new tools to increase resiliency. Leverage existing research partnerships with FEMA for flood resiliency and modernization of hurricane technologies and other relevant programs.

- **Impact:** Severe weather events alone, including floods and hurricanes, now cause over $10 billion dollars per year in damages in the United States. If this program can reduce the future costs of disasters related to weather by 1% due to improved resiliency, the impact will be over $100M in annual benefits. In addition, Federal, state and local organizations will have improved tools to guide mitigation investments, and manage response and recovery operations, resulting in improve community and national resiliency.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	620	1,986
Obligations	-	-	-	-	-

FY 2017 Key Milestone Events (Year of Execution)

- Development of program and project management plans.
- Identify key stakeholders and research collaboration partners.
- Initiate preliminary research in support of resiliency data development.
- Establish initial transition concepts.

FY 2018 Key Milestone Events (Budget Year)

- Develop research plan.
- Initiate three resiliency research program with key stakeholders.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2017		
Development of program and project management plans.	FY 2017 Q2	FY 2017 Q4
Identify key stakeholders and research collaboration partners.	FY 2017 Q3	FY 2017 Q4
Initiate preliminary research in support of resiliency data development.	FY 2017 Q4	FY 2018 Q3
Establish initial transition concepts.	FY 2017 Q4	FY 2018 Q2
FY 2018		
Develop and coordinate research plan with stakeholders.	FY 2018 Q1	FY 2018 Q2
Initiate and complete three resiliency research programs with key stakeholders.	FY 2018 Q3	FY 2019 Q3

Type of Research

Applied

Technical Readiness Level

The program plans to begin at TRL3 and end at TRL 8.

Transition Plans

- Transition will be accomplished through partnership and collaboration with key partners. Initially, it is envisioned that tools developed from this activity will be adopted incrementally by Federal, state and local organizations to replace and update existing infrastructure used to plan mitigation programs and respond to and recover from disasters.

Cyber for Critical Infrastructure

- **Problem:** Critical infrastructure is vital to our national security, economy, public health and well-being. This infrastructure has become increasingly global, complex, and susceptible to disruptions. DHS needs enhanced awareness of potential disruptions and 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 of the relevant linkages, such as sector interdependencies and cybersecurity risk factors. As a result, formulation of risk-informed designs that can incorporate resilience remains a challenge. Such things as cyber intrusions, natural hazards, and a range of human factors, including inadvertent errors and malicious acts, affect the resilience of critical infrastructure systems.

- **Solution:** 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, sectors, and international partners to build on existing risk assessment tools and platforms to incorporate cross-sector interdependencies.

- **Impact:** The global economy has become increasingly dependent on legacy and complex systems and the infrastructure that supports them. The efficiency and reliability of these interconnected and interdependent 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 withstand, absorb, recover, and adapt to ensure that the needed level of functionality is provided.

Sub Projects

- *Critical Infrastructure Design and Adaptive Resilient Systems (CIDARS)* - the CIDARS project is examining innovative approaches to plan and design adaptive performance into critical infrastructure systems. The goal is to create common capabilities and quantitative approaches that facilitate the development and implementation of integrated solutions that will enable secure and resilient service provisioning.
- *Cyber Resilient Energy Delivery Consortium* - The consortium is developing solutions through R&D, education and industry engagement. CREDC will generate research, evaluate the results and deploy solutions in the marketplace. The project's foci include cyber protection technologies; cyber monitoring, metrics, and event detection; risk assessment of Energy Delivery Systems (EDS) technology; data analytics for cyber event detection; resilient EDS architectures and networks; and identifying the impact of disruptive technologies such as the Internet of Things and cloud computing on EDS resiliency.
- *Cybersecurity for Oil & Gas Systems (COGS)* – This project facilitates research, development, testing and evaluation procedures to improve cybersecurity in petroleum industry digital control systems. The project undertakes collaborative R&D projects to improve the level of cybersecurity in critical systems of interest to the oil and natural gas sector. The objective is to promote the interests of the sector while maintaining impartiality, the independence of the participants and vendor neutrality.
- *CISR Characterization* - This project identifies and characterizes functional interactions among critical infrastructure sectors with a focus on key physical, social, and behavioral dependencies.
- *Risk Informed CISR Restoration* – This project focuses on the development of risk-informed, integrated resource allocation decision support for critical infrastructure restoration, renewal, and redesign.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	-	-	-	-	3,650
Obligations	-	-	-	-	-

FY 2018 Key Milestone Events (Budget Year)

- Finalize and release final report of a study on vulnerabilities on Safety Instrumented Systems (SIS) and basic Process Control Systems (PCS).
- Select and develop specifications for the testing and evaluation procedures of a new project.
- Identify and prioritize gaps in the existing data and model set based on synthetic data solicitation findings.
- Develop a framework for a pilot mapping of sector interdependencies at the community, industry, regional, and national levels, that identifies the key relationships necessary to support model development.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2018		
Analyze and review findings from test and evaluation, begin drafting final report.	FY 2018 Q1	FY 2018 Q1
Compare existing tools and methodologies for modeling critical infrastructure systems with proposed synthetic data approaches developed based on FY17 soliciation.	FY 2018 Q1	FY 2018 Q3
Create scalable framework application of synthetic data approach to consider interdependencies as a pilot program.	FY 2018 Q2	FY 2019 Q2
Coordinate with NPPD, sector, and international partners to enhance impact of synthetic framework application.	FY 2018 Q1	FY 2019 Q2

Type of Research

Applied

Technical Readiness Level

TRL will vary between specific portfolio projects.

Transition Plans

- Tools, findings, reports, and methodologies will be shared with other organizations, such as NPPD, sector, and international partners, to improve the formulation of risk-informed designs for critical infrastructure that can incorporate resilience and improve DHS's awareness of potential disruptions.

Aligning Departmental R&D with DHS Goals (Integrated Product Teams)

- **Problem**: There is a need in DHS to identify and prioritize R&D capability gaps. Department-wide coordination is required to determine the R&D efforts needed to close those gaps and meet the most pressing needs of the Components.

- **Solution**: In 2015, DHS established the R&D Integrated Product Teams (IPTs) as the Department's primary collaboration mechanism for DHS-wide R&D coordination. Over these last two years, IPTs have played a central role in identifying and prioritizing R&D technological capability gaps. By introducing more advanced data methodologies and standards, IPTs are shifting the R&D culture within DHS to provide a reproducible mechanism that results in a list of high priority R&D gaps by

documenting, tracking, and closing-out the required R&D. IPTs accomplish this by mapping prioritized R&D technological capability gaps to specific R&D projects. As a consequence, IPTs have moved DHS from a Component-dependent R&D profile to a more agile enterprise that is based on an R&D needs and sound investment strategies.

- **Impact**: The institutionalization of coordinated DHS R&D needs to close prioritized technological capabilities gaps is yielding significant results. The benefits start with a comprehensive profile of R&D being conducted across the Department. This profile encourages a balanced DHS-wide R&D approach to address current R&D needs, emerging R&D needs, and unanticipated R&D needs. Meeting the short and long term objectives is directly attributable to the emergence of an agile IPT Process. In addition, cost savings are realized through the leveraging of the elimination of duplicative R&D efforts and other entities performing R&D: DoD, federal agencies, industry, academia, and international partners. The successful DHS-wide collaboration advanced through the IPT Process is leading to improved accountability and reduced duplications. This data-driven IPT Processes ensure seamless connectivity between operators and technical experts. Improvements, led by IPT advancements, focus on key areas:
  - Data quality – Components provided an increased level of detail for funded R&D projects.
  - Data analytics – DHS S&T develops a portfolio management tool focused on machine learning and natural language recognition to better map high priority technology gaps to R&D projects.
  - Standardized prioritization criteria – IPT stakeholders coordinated the Component-led IPT Prioritization Working Group that established standards and definitions for ranking R&D technological capability gaps.
  - Increased decision transparency – The *FY 2017 IPT Report* was informed by a ranking and prioritization system called Analytic Hierarchy Process (AHP).
  - Improved alignment of R&D projects to high-priority areas – IPT Operations introduced a data analytical process to transform collected IPT data into useful characteristics and enable natural sorting into mission critical bins and categories.

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Budget	-	-	-	-	5,000
Obligations	-	-	-	-	-

FY 2018 Key Milestones (Budget Year)

- Automate IPT Processes for eliminating duplication and identifying R&D gaps solutions by implementing

additional data analytics that will result in increased efficiencies. Develop a DHS-wide R&D plan based on the data gathered via the IPT Process.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
FY 2016		
Developed the mechanism and protocols necessary to gather Department-wide R&D data and prioroities and report prioritization. results.	FY 2016 Q1	FY 2016 Q4
FY 2017		
Improve the mechanism and protocols necessary to gather Department-wide R&D data; establish a standardized profile of R&D gaps and R&D projects; and deliver an annual report on prioritized R&D gaps in order to close-out GAO findings.	FY 2017 Q1	FY 2017 Q4
FY 2018		
Complete a DHS-wide R&D plan that focuses on closing the high-priority R&D gaps by continuing to implement the IPT Desion Framework and IPT Gap Lifecycle. Provide the necessary tools and support to R&D gap owners (Components) to ensure gaps continue to reflect mission priorities; define R&D requirements to close the gaps; and ensure gap closure approaches are tracking programatically and within budget.	FY 2018 Q1	FY 2018 Q4

Type of Research

The IPT process applies to all types of R&D Basic, Applied or Developmental.

Technical Readiness Level

The IPT mechanisms and process provide a variety of TRL levels 1-7.

Transition Plans

As noted earlier, the IPTs support and track the HSE customer/Component and assists the components with the necessary tools (operation of a technology or knowledge products) to transition the R&D gap.

University Programs - PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
University Programs	-	-	$39,724	-	-	$39,724	-	-	$29,724	-	-	($10,000)
Total	**-**	**-**	**$39,724**	**-**	**-**	**$39,724**	**-**	**-**	**$29,724**	**-**	**-**	**($10,000)**
Subtotal Discretionary - Appropriation	-	-	$39,724	-	-	$39,724	-	-	$29,724	-	-	($10,000)

PPA DESCRIPTION: University Programs

S&T Requests $29.724M for University Programs in FY 2018.

University Programs PPA: The Office of University Programs (OUP) supports 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. OUP's COEs 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's divisions, DHS Components, and Federal, State, and local government agencies.

University Programs – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$39,724		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$39,724**	**$39,724**	**$29,724**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$3,519	$7,090	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$43,243**	**$46,814**	**$29,724**
Collections – Reimbursable Resources	$460	$500	$500
Total Budget Resources	**$43,703**	**$47,314**	**$30,224**
Obligations (Actual/Projections/Estimates)	$36,532	$39,550	$25,265
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

The FY 2018 estimated obligation is $25.265M out of an estimated $30.224M of total budgetary resources. Total budget obligations for FY 2017 and FY 2018 are based on FY 2016 execution totals.

University Programs – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$39,724**
FY 2016 Revised Enacted	**-**	**-**	**$39,724**
FY 2017 Annualized CR	**-**	**-**	**$39,724**
FY 2018 Base Budget	**-**	**-**	**$39,724**
FY 2018 Current Services	**-**	**-**	**$39,724**
S&T - University Programs Centers of Excellence R&D	-	-	($10,000)
Total, Program Decreases	**-**	**-**	**($10,000)**
FY 2018 Request	**-**	**-**	**$29,724**
FY 2017 TO FY 2018 Change	**-**	**-**	**($10,000)**

PPA Description

S&T requests $29.724M for University Programs in FY 2018.

University Programs PPA: The OUP supports 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. OUP's COE 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's divisions, DHS Components, and Federal, State, and local government agencies.

The $10.000M reduction in funding for the Centers of Excellence will result in the elimination of one COE, the Maritime Security COE, and the non-recompete of two other COEs, the Cross Border Threat Screening and Supply Chain COE, and the Counterterrorism COE. This will allow S&T to focus its R&D efforts on DHS and Administration priorities.

Component access to the centers will remain available through basic ordering agreements maintained by S&T. OUP will continue to

harnesses the intellectual power of America's universities for homeland security research, development and education to deliver tools, technologies, knowledge products, training and expertise to the Homeland Security Enterprise through the remaining COEs.

Adjustments to Base Justification

There are no adjustments to base in FY 2018.

University Programs – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
University Programs	$39,724	$39,724	$29,724	($10,000)
Total	**$39,724**	**$39,724**	**$29,724**	**($10,000)**
Discretionary - Appropriation	$39,724	$39,724	$29,724	($10,000)

The non-pay request for FY 2018 is $29.724M. The decrement of $10.000M is associated with the elimination of one COE, and the non-recompete of two other COEs.

University Programs – PPA
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$110	$110	$82	($28)
25.1 Advisory and Assistance Services	$2,587	$2,587	$1,936	($651)
25.2 Other Services from Non-Federal Sources	$2	$2	$1	($1)
25.3 Other Goods and Services from Federal Sources	$1,562	$1,562	$1,169	($393)
25.5 Research and Development Contracts	$2,050	$2,050	$1,534	($516)
41.0 Grants, Subsidies, and Contributions	$33,413	$33,413	$25,002	($8,411)
Total - Non Pay Object Classes	**$39,724**	**$39,724**	**$29,724**	**($10,000)**

Reduction in object class is directly proportional with the decrease in the FY 2018 request.

Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Grants, Subsidies, and Contributions	$33,413	$33,413	$25,002	($8,411)
Advisory and Assistance Services	$2,587	$2,587	$1,936	($651)
Research and Development Contracts	$2,050	$2,050	$1,534	($516)
Other Goods and Services from Federal Sources	$1,562	$1,562	$1,169	($393)
Travel and Transportation of Persons	$110	$110	$82	($28)
Other Services from Non-Federal Sources	$2	$2	$1	($1)
Total – Non Pay Cost Drivers	**$39,724**	**$39,724**	**$29,724**	**($10,000)**

NARRATIVE EXPLANATION OF CHANGES

Grants, Subsidies, and Contributions: The decreases are proportional to the reduction in funding to the Centers of Excellence. Grants, Subsidies and Contributions are the financial assistance funding that invests in the Centers of Excellence.
Advisory and Assistance Services: The decreases are proportional to the Centers of Excellence reductions. Advisory and Assistance services are contractual costs associated with administering the Centers of Excellence.
Research and Development Contracts: The decreases are proportional to the Centers of Excellence reductions. Research and Development Contracts are the direct cost of conducting research and development associated with the Centers of Excellence.
Other Goods and Services from Federal Sources: The decreases are proportional to the Centers of Excellence reductions. Other Goods and Services from Federal Sources represents funding that is placed with other government agencies under the authority of the Economy Act.
Travel and Transportation of Persons: The decreases are proportional to the Centers of Excellence reductions.
Other Services from Non-Federal Sources: The decreases are proportional to the Centers of Excellence reductions.

Research and Development
Technology Readiness Level Exhibit

Project Description:
University Programs

PPA DESCRIPTION: University Programs
OUP supports 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. OUP's COEs 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's divisions, DHS Components, and Federal, State, and local government agencies.

Centers of Excellence Project Descriptions:

FY 2017 Annualized Continuing Resolution: $36.328M. FY 2018 Request: $26.328M.

The Center for Homeland Security Quantitative Analysis (CHSQA):

New COE - This Center will conduct DHS component-focused research to enhance the development and application of quantitative approaches to counter security threats and natural hazards. Also, the CHSQA COE will develop quantitative education and training for DHS staff to modernize operations and improve data analysis, increase operational efficiency, identify the economic impact of security threats, and assess future risks to homeland security.

Problem: Given the increased numbers and types of threats, as well as rapidly expanding data management needs, security agencies at all levels need new approaches and technologies to improve analysis for decision makers. The challenges to security require new and targeted products that can provide security professionals with an operational advantage. These products must be based on sound research, tested in operational settings and transitioned to operational users.

Solution: The Center will develop and transition the next generation of mathematical, computational, and statistical tools to advance DHS's capabilities in quantitative analysis.

Impact: In partnership with operational DHS agencies and others, OUP will work with CHSQA to transition analytical products and

educational programs to the DHS workforce. DHS will work with multiple public and private stakeholders to test these capabilities in operational and strategic settings, and then make these solutions available and useful to all partners.

FY 2016 Key Milestone Events (Prior Year)

- NA

FY 2017 Planned Key Milestone Events (Year of Execution)

- NA

FY 2018 Planned Key Milestone Events (Budget Year)

- In FY 2018 Q1, CHSQA will finalize its research agenda and thrust areas through a series of workshops for lead institution personnel, OUP officials, and the corresponding Federal Coordinating Committee (FCC).
- In FY 2018 Q1, CHSQA will explore innovative simulation and modeling methods to confront the challenges terrorism poses to the DHS mission set. Subtopics may include social media, critical infrastructure, or cyber security.

Critical Infrastructure Resilience Institute (CIRI): This Center conducts research and education to enhance the resiliency of the Nation's critical infrastructures, and the businesses and public entities that own and operate them. This research will provide a better understanding of risk management of catastrophic disruptions to infrastructure operations.

Problem: The Federal government needs industries and regional economies working again as soon as possible after catastrophic events, particularly in locales that also host critical infrastructure systems and industries. Therefore, DHS must understand the complex public and private sector linkages that comprise an infrastructure system and community and how the severe stress of catastrophic events impacts them.

Solution: 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.

Impact: The Center's work will result in data-rich quantitative analyses, technologies, and other tools that assist DHS and the critical infrastructure industry in understanding threats and vulnerabilities, risk management strategies, and costs and trade-offs of risk management decisions.

FY 2016 Key Milestone Events (Prior Year)

- Developed and formalized the Center's vision, strategy, and business practices necessary to establish a high quality and relevant research portfolio.
- Conducted 10 research projects focused on helping infrastructure owners and operators better understand their dependency on critical infrastructures in general.

- Conducted 10 research projects focused on how to better understand what the risks and threats are to cyber assets.
- Conducted 10 research projects focused on understanding how business decisions concerning risk are made. CIRI identify gaps in cyber-physical technologies that improve resiliency, and will develop prototypes of new technologies.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Develop a transition framework to be used by the CIRI to guide advanced technical development, integrate outputs, and provide the supporting business elements necessary to transfer intellectual property to third parties in the public and private sectors.

FY 2018 Planned Key Milestone Events (Budget Year)

- By FY 2018 Q2, conduct Biennial Review to evaluate CIRI's research portfolio at both theme and project levels for research quality, progress, and interest of homeland security customer segments, and implement recommendations to adjust portfolio investment by Q3.
- By FY 2018 Q3, integrate research outputs into three concentrations supporting the refinement of projects in: next generation risk assessment approaches, approaches to understand the mitigation of risks posed by cyber-attacks to manufacturing, and the role that market based incentives can play in stimulating private sector resilience investment.

Cross Border Threat Screening and Supply Chain Defense (CBTS): *New COE* - This COE will conduct research and develop solutions, protocols, and capabilities to support the identification of biological threats and/or hazards at ports of entry, land borders, and other critical nodes within the supply chain.

Problem: The fields of biology, bioengineering, and supply chain analytics are rapidly evolving, bringing with them new biological threats and hazards. DHS needs to ability to better understand current and emerging biological threats that are faced at ports of entries (POE) and land borders that may significantly affect the health and well-being of people, animals, plants, and therefore the Nation's critical infrastructure and economy.

Solution: The Center will assist DHS by developing innovative technologies, optimized operational procedures, and a skilled workforce trained in the latest methods to identify and respond to biological threats and their impacts on health and the economy.

Impact: S&T will eliminate this COE in FY 2018 due to competing DHS priorities in a fiscally constrained environment.

FY 2016 Key Milestone Events (Prior Year)

- NA

FY 2017 Planned Key Milestone Events (Year of Execution)

- Developed a Notice of Funding Opportunity (NOFO) announcement in FY2017 Q2 using OUP processes for engaging DHS Components.

FY 2018 Planned Key Milestone Events (Budget Year)

N/A

Counterterrorism Center of Excellence (CTCOE): *New COE* - This Counterterrorism COE will examine adversarial behavior within the homeland and beyond our borders to better understand and anticipate evolving threats and the effectiveness of counterterrorism efforts. The thrust areas of this COE continue to be developed, guided by literature review and subject matter expert interviews from DHS Components and other Federal agencies. Potential themes or topics include: the effectiveness of counterterrorism efforts and technologies and their application to the homeland, security concerns related to preventing attacks on U.S. critical infrastructure including cyber systems, emerging threats of foreign terrorist fighters returning to the United States, and technological capabilities to identify homegrown violent extremists.

Problem: Protecting the homeland requires preventing terrorist threats and anticipating how the threat will evolve. In order for the U.S. government to develop evidence-based counterterrorism policy that is lawful, rational, and effective, the impact of U.S. government counterterrorism tactics, strategies, and tools must be evaluated.

Solution: This COE will equip DHS Components and other Federal agencies with the tools, technologies, and training capabilities needed to deter terrorist activity and to protect the country from extremist-inspired attacks within the homeland. A more detailed approach will become available when this COE is formally announced and competed.

Impact: S&T will eliminate this COE in FY 2018 due to competing DHS priorities in a fiscally constrained environment.

FY 2016 Key Milestone Events (Prior Year)

- N/A

FY 2017 Planned Key Milestone Events (Year of Execution)

- N/A

FY 2018 Planned Key Milestone Events (Budget Year)

- N/A

Arctic Domain Awareness Center (ADAC): This Center develops and transitions technology solutions, innovative products, and educational programs to improve situational awareness and crisis response capabilities related to emerging challenges posed by the dynamic Arctic environment.

Problem: The lack of Arctic domain knowledge inhibits situational awareness in the Arctic for the USCG and DHS security and response missions. Imagery, data, and communications, and scientific understanding of the operating environment are insufficient to develop reliable operational responses to mission needs.

Solution: ADAC conducts relevant research and development that benefits USCG operations, with particular emphasis on mission areas of high consequence: vessel intrusion, threats to navigation, search and rescue, humanitarian assistance, and disaster response. Results serve USCG, other DHS Arctic missions.

Impact: ADAC's impact will affect future operations by advancing knowledge in Arctic Domain Awareness research areas that improve USCG's Arctic operator coordination, control, and decision making.

FY 2016 Key Milestone Events (Prior Year)

- Developed an accurate, high resolution (from 4km to 2km) regional High-resolution Ice-Ocean Modeling and Assimilation System (HIOMAS) using the Regional Ocean Modeling System (ROMS).
- Used distributed human observers (comprised of two Bering Strait communities) as sensors to systematically observe and document Arctic environmental and globalization changes.
- Improved oil spill modeling and planning in the arctic by providing higher resolution (from 4 km to a target of 2 km) ocean current and sea ice data.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Conduct Biennial Review to evaluate the ADAC's research portfolio at both theme and project levels for research quality, good progress, and committed HSE customers.

FY 2018 Planned Key Milestone Events (Budget Year)

- Reorient ADAC Research Program based on the results of the Biennial Review held in FY 2017 Q3.
- Finalize Basic Polar Navigation Course curriculum for arctic mariner by FY 2018 Q2.

Maritime Security Center (MSC): The Center conducts research to support DHS's and other Federal agencies' Arctic security missions. This includes improving detection and interdiction capabilities, enhancing catastrophic event response, and increasing marine transportation system security and efficiency.

Problem: Understanding what is on, above, and below the water is critical to operations. Transparency in the maritime domain is a key challenge for USCG and CBP's Air & Marine Operations.

Solution: MSC develops solutions and educational programs to improve Maritime Domain Awareness capabilities for preventing and responding to events in the maritime domain, increasing the resiliency of the Nation's Marine Transportation System, and enhancing the technical skills and leadership capabilities of the country's current and prospective maritime security workforce.

Impact: Operational impacts include the ability to improve wide area surveillance of large open areas of ocean, increased fidelity of vessel traffic in the approaches to U.S. coastal and port areas, and tools to improve the assessment of resiliency in port areas to assist in the response and recovery after a significant event. S&T will eliminate this COE in FY 2018 due to competing DHS priorities in a fiscally constrained environment.

FY 2016 Key Milestone Events (Prior Year)

- Connected at least 10 students with MSC stakeholders and engaged them in research projects (e.g. improving port resilience) that are responsive to and directly impact the knowledge and technology needs of maritime and homeland security practitioners.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Conduct Biennial Review to evaluate MSC's research portfolio at both theme and project levels for research quality, good progress, and committed HSE customers.

FY 2018 Planned Key Milestone Events (Budget Year)

- N/A.

Borders, Trade, and Immigration Institute (BTI Institute): BTI conducts research and provides education to enhance the Nation's ability to secure its borders and facilitate legitimate trade and travel. It also conducts research to help CBP, ICE, and U.S. Citizenship and Immigration Services (USCIS) effectively enforce immigration and customs laws; promoting awareness and understanding of citizenship; and ensuring the integrity of the U.S. immigration system.

Problem: Transnational challenges associated with border security and immigration require innovations in technology-based tools and techniques for border management, trade facilitation, targeting, and enforcement. R&D is necessary to determine the principal global transnational and national influences and factors that impact border, trade, security, and immigration activities.

Solution: BTI Institute delivers technology solutions, data-informed policies, and trans-disciplinary education to address the Nation's challenges as they relate to border control, customs, trade and travel facilitation, security, and enforcement.

Impact: BTI impacts include improving the operational effectiveness of cargo security processes at ports of entry, identifying opportunities to counter weapons of mass destruction (WMDs) proliferation through export control enforcement, and improving video and imagery capabilities that identify people in operational environments.

FY 2016 Key Milestone Events (Prior Year)

- Established 17 projects with the CBTIR research consortium to address knowledge and technology gaps and provide targeted education resources to address the Nation's challenges as they relate to border control, customs, trade, immigration and enforcement.
- Devised a strategy to identify opportunities for improved administration and enforcement of nonproliferation-specific

export controls.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Conduct Immigration Workshop to identify knowledge and capability gaps regarding three major immigration issues; conduct a competition seeking research to address gaps.

FY 2018 Planned Key Milestone Events (Budget Year)

- Conduct Biennial Review to evaluate BTI Institute's research portfolio at both theme and project levels for research quality, good progress, and committed HSE customers.
- Finalize the impact of the ongoing Export Control Reform Initiative on U.S. Government efforts to enforce export controls in support of counters the proliferation of WMDs.

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 natural hazards such as floods and hurricanes. It also considers the impact of future climate trends on coastal resilience.

Problem: Damage caused by floods and hurricanes poses a near-constant threat to lives and property. A lack of resilience to natural hazards at the individual and community level is contributing to the increasing public share of disaster response and recovery costs. The 30-year average losses from flooding alone through 2014 are nearly $8 billion per year in property damage and 82 deaths (http://www.nws.noaa.gov/hic/).

Solution: CRC's work directly addresses key challenges associated with growing coastal vulnerability and assists S&T, FEMA, USCG, NPPD and local communities in coordination with public and private sector partners. Coastal Infrastructure Resilience examines new methods to assess vulnerability and assist practitioners. Building Resilient Communities conducts research and education to help communities mitigate, recover, and adapt to natural hazard risks. Disaster Dynamics advances coastal storm surge and flood forecasting capabilities and communicates the results to improve coastal resilience through flood risk maps and other mechanisms.

Impact: CRC's work produces tangible research and education results for use by DHS, other Federal agencies, state and local governments, and other relevant entities that help reduce the adverse impacts of coastal natural disasters on the Nation's citizens, infrastructure, and economy.

FY 2016 Key Milestone Events (Prior Year)

- Finalized project work plans and initiate research and education projects with a goal of expanding coastal resilience understanding through rigorous, integrated, and interdisciplinary research.
- Developed at least two new tools and methods to assess and enhance physical, social, economic, environmental, and institutional resilience.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Host a minimum of five students from MSIs through the Coastal Resilience Summer Research Experience.

FY 2018 Planned Key Milestone Events (Budget Year)

- Quantify hurricane rainfall statistics and their contributions to total hurricane flooding to enable development of a method for including rainfall-runoff effects into FEMA's joint probability method for coastal flood hazard studies.
- Revise Center project transition plans based on outcomes of its Biennial Review.

Criminal Investigations and Network Analysis (CINA): *New COE* -This Center will conduct end user-focused research to enhance investigation strategies to address transnational criminal organizations (TCO) activities and other homeland security-related crimes. This COE will also provide education and professional development to improve the cost-effectiveness of criminal investigations, prosecution, prediction, and prevention.

Problem: Trans-national criminal organizations are committing heinous crimes in both physical and cyber space. This COE will focus on a major, cross-cutting DHS mission area, criminal law enforcement that the COEs have not yet addressed. The DHS QHSR contains the goals of Preventing Terrorism and Enhancing Security, Securing and Managing Our Borders, Enforcing and Administering Immigration Laws, and Securing Cyberspace.

Solution: The overarching goal of the Center will be to develop tools and methods for agents, officers, and investigators to better coordinate investigative strategies with on-the-ground and cybersecurity activities to predict, thwart, and prosecute crime.

Impact: Research outcomes will include analytical tools, technologies, and knowledge products for the workforce. The Center will produce new capabilities, test them in operational settings, and make validated solutions available and useful to law enforcement agencies at all levels.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Select COE performer for new criminal investigations COE topic area.

FY 2018 Planned Key Milestone Events (Budget Year)

- In FY 2018 Q1, CHSQA will finalize its research agenda and thrust areas through a series of workshops attended by lead institution personnel, OUP officials, and the corresponding Federal Coordinating Committee (FCC).

Center for Awareness and Localization of Explosives-Related Threats (ALERT): This Center conducts transformational research, technology development, and education initiatives for effective characterization, detection, and response to the explosives-related threats facing the country and the world.

Problem: Technology developers require improved characterization of illicit explosives to enhance capabilities such as ultra-reliable

screening, detection at a distance, and actionable trace sampling.

Solution: ALERT works with industry and government partners in the security community to transition solutions that address explosives threat detection capability gaps identified by the DHS components. Examples of cutting-edge project topics include: new improvised explosives, stand-off spectroscopy, multi-modality imaging, and video analytics and signature analysis. With the collaboration of its industry and national laboratory partners, ALERT transitions research into field-able systems, such as a video analytics-based threat detection system for use in airports and other venues. ALERT also provides training and education to professionals and students to enter the DHS workforce.

Impact: ALERT is providing cutting-edge projects to include: study of new improvised explosives, stand-off spectroscopy, multi-modality imaging, and video analytics and signature analysis. With the collaboration of its industrial and national laboratory partners, ALERT will also focus on transitioning research into field able systems, such as a video analytics-based threat detection system for use in airports and other venues.

FY 2016 Key Milestone Events (Prior Year)

- Demonstrated standoff (>2 meters) concealed explosive simulant detection and measurement capability using multi-modality testbed.
- Expand the first-year engineering hands-on laboratory class to members of ALERT and community college partners.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Complete laboratory development of prototype millimeter wave standoff detection and measurement capability in an ALERT laboratory for collaboration and demonstrations of relevance with TSA and/or homeland security vendors.
- Complete a mock checkpoint for use in video analytics studies relevant to TSA.

FY 2018 Planned Key Milestone Events (Budget Year)

- Complete algorithm development of concealed penetrable-dielectric-material-on-body characterization (specifically for high explosives) to be used in conjunction with existing fielded millimeter wave AIT detection systems. Establish collaborative interaction with homeland security vendors and demonstrate the effectiveness to TSA.

Training Institute for Quantitative Analysis (TIQA): *New –Workforce Development and Training* –The Quantitative Analysis Training pilot is in the exploration and planning phase. The goal is to maximize DHS S&T's return on investment in university-based research and education by leveraging the research and knowledge developed within the COE network and applying it to DHS workforce requirements. TIQA would develop one or more pilot programs that deliver quantitative analysis training to DHS Components based upon identified needs. The performers would work with the S&T's OUP to design curricula, leverage existing research knowledge and tools, and deliver training to DHS personnel.

Problem: About 70 percent of the DHS workforce is classified as law enforcement personnel. About 10 percent of the DHS

workforce is classified as STEM professionals. To successfully achieve its mission goals, DHS must increase the quantitative analyses capabilities of its workforce.

Solution: This proposed effort would (1) assess gaps that exist between current HSE workforce capabilities and job requirements and (2) determine the best approaches to deliver effective training to enhance the HSE workforce's capabilities to conduct quantitative analyses.

Impact: Enhance HSE workforce capabilities to conduct quantitative analyses in support of operations or intelligence analysis.

FY 2016 Key Milestone Events (Prior Year)

- NA

FY 2017 Planned Key Milestone Events (Year of Execution)

- NA

FY 2018 Planned Key Milestone Events (Budget Year)

- In FY 2018 Q1, develop SOW for framework of Training Center.

Minority Serving Institutions (MSI): FY 2017 Annualized Continuing Resolution: $3.396M. FY 2018 Request: $3.396M. This program enhances the capabilities of Minority Serving Institutions (MSIs) to develop homeland security-related science, technology, engineering, and mathematics research and curricula, and prepare MSI students for successful HSE careers. Current MSI programs, including the Scientific Leadership Award (SLA) program and the Summer Research Team (SRT) program, are developing course content and training in areas critical to homeland security while they also build enduring partnerships with COEs. With small investments, S&T expects to realize significant returns in the development the next generation of scientists and engineers focused on homeland security.

Problem: Federal security agencies needs a diverse, well-qualified analysts and technologists to enter the homeland security science and engineering workforce.

Solution: OUP will provide funding to MSIs to design innovative HS-STEM curricula; support academic enhancements; provide student internships and other experiential learning opportunities; and support DHS-relevant research projects or initiatives with significant involvement of early career faculty and in coordination with DHS COEs.

I**mpact**: MSI students will enter HS-STEM related careers or obtain admission to graduate school to continue HS-STEM related research, increasing diversity and representation within the future homeland security science and engineering workforce.

FY 2016 Key Milestone Events (Prior Year)

- Made SLA awards available through an open competitive process and completed competition process.
- Completed a 10 week SRT program for MSIs that provides experience for teams consisting of a faculty member and up

to two students to perform research at a DHS COE that aligns with the agency's mission.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Make three to six MSI SLA awards available through an open competitive process.
- Complete a 10-week SRT program for MSIs that provides experience for teams consisting of a faculty member and up to two students to perform research at a DHS COE that aligns with the agency's mission.
- Hold a goal-setting workshop for the COEs and MSIs to streamline engagement collaboration and transition of students and research results.

FY 2018 Planned Key Milestone Events (Budget Year)

- Award MSI grants to colleges and universities at or above funding levels report in the prior fiscal year's MSI report to the Office of Civil Rights Executive Order Summary Report.
- Provide award management activities for 10 SLA awardees and 16 SRT awardees that enable DHS S&T and Components to access scientific expertise at academic MSI institutions and their partners.

Project Schedule

Research & Development Description	Plan Start Date	Planned Completion
Prior Year		
FY 2015 Annual report review.	FY 2016 Q1	FY 2016 Q1
FY 2016 Work plan, development and submission.	FY 2016 Q2	FY 2016 Q2
FY 2016 Work plan approval and Project Initiation or continuation.	FY 2016 Q3	FY 2016 Q3
FY 2016 Annual report development and submission.	FY 2016 Q4	FY 2016 Q4
Year of Execution		
FY 2016 Annual report review.	FY 2017 Q1	FY 2017 Q1
FY 2017 Work plan, development and submission.	FY 2017 Q2	FY 2017 Q2
FY 2017 Work plan approval and Project Initiation or continuation.	FY 2017 Q3	FY 2017 Q3
FY 2017 Annual report development and submission.	FY 2017 Q4	FY 2017 Q4
Budget Year		
FY 2017 Annual report review.	FY 2018 Q1	FY 2018 Q1
FY 2018 Work plan, development and submission.	FY 2018 Q2	FY 2018 Q2
FY 2018 Work plan approval and Project Initiation or continuation.	FY 2018 Q3	FY 2018 Q3
FY 2018 Annual report development and submission.	FY 2018 Q4	FY 2018 Q4

Type of Research

COE research is categorized as basic and is subject to change with the overall strategic approach since it may evolve over time. COEs manage a range of projects that span from early applied research through development. The balance of research depends upon the scientific domain, strategic needs, and the project progress.

Applied	Applied research is defined as systematic study to gain knowledge or understanding necessary to determine the means by which a recognized and specific need may be met.
Developmental	Development is defined as systematic application of knowledge or understanding, directed toward the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements.

Technical Readiness Level

The COEs execute projects that span the TRL range. Primarily, COEs conduct projects between TRL 2 through 6, from technology concepts to system prototypes in a relevant environment.

Transition Plans

OUP Program Managers work with the COEs to structure and position projects to align with end-user needs during concept development, testing, and piloting. COE transition activities differ depending upon the research gap being addressed, but often involve partnerships with service and technology providers, such as data owners, commercialization entities, and even DHS Components. OUP's management methods are designed to reduce the technical and programmatic risks of a new technology to the point where industry and other Federal customers are willing to invest in the technology or acquire it directly.

OUP Program Managers work with S&T's Office of General Counsel, the General Counsel of the performing institution(s), and the Technology Commercialization Offices, and they recognize the Bayh-Dole Act, which was designed to improve technology transfer by shifting the responsibility of protecting intellectual property to universities in exchange for Federal funding. DHS encourages COEs work with their technology transfer offices to attract investments, address legal concerns, and leverage university infrastructures to execute the plans necessary to enable long-term sustainment of technologies.

Department of Homeland Security

Domestic Nuclear Detection Office

Budget Overview

Fiscal Year 2018

Congressional Justification

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Domestic Nuclear Detection Office
Appropriation Organization Structure

Organization Name	Level	Fund Type (* Includes Defense Funding)
Domestic Nuclear Detection Office	**Component**	
Operations and Support	**Appropriation**	
Mission Support	PPA	Discretionary - Appropriation
Procurement, Construction, and Improvements	**Appropriation**	
Large Scale Detection Systems	PPA,Investment	Discretionary - Appropriation
Human Portable Rad/Nuc Systems	PPA,Investment	Discretionary - Appropriation
Research and Development	**Appropriation**	
Architecture Planning and Analysis	PPA	Discretionary - Appropriation
Transformational Research and Development	PPA	Discretionary - Appropriation
Detection Capability Development	PPA	Discretionary - Appropriation
Detection Capability Assessments	PPA	Discretionary - Appropriation
Nuclear Forensics	PPA	Discretionary - Appropriation
Federal Assistance	**Appropriation**	
Federal, State, Local, Territorial, and Tribal Support	PPA	Discretionary - Appropriation
Securing the Cities	PPA	Discretionary - Appropriation

Domestic Nuclear Detection Office
Strategic Context

Component Overview

The Domestic Nuclear Detection Office (DNDO) is comprised of the following mission-oriented programs that support achievement of the DHS strategic missions, goals, and objectives.

Architecture Planning and Analysis: The Architecture Planning and Analysis program coordinates the development of an enhanced Global Nuclear Detection Architecture through the implementation of 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.

Detection Capability Development: The Detection Capability Development program generates advanced technology capabilities through acquisition and development programs and ensures that efficient and effective purchasing agreements are in place. This is accomplished through partnership with industry to acquire and develop radiological and nuclear detection systems and solutions that meet government requirements. For existing systems, the directorate continues to monitor systems performance to ensure continued field capability and provide feedback for future improvements.

Large Scale Detection Systems: The Large Scale Detection System program supports the Departments' efforts to maintain and improve scanning coverage using radiation portal monitors (RPM) at land border crossings, seaports, international airports (including international preclearance sites), and international mail and express consignment courier facilities. The program deploys and manages the installed RPM inventory and reconfigures sites as required to maintain coverage.

Human Portable Rad/Nuc Systems: The Human Portable Rad/Nuc Systems (HPRDS) program supports DHS Components whose mission is to detect and identify rad/nuc threats. HPRDS scanners are relatively lightweight, easy to use, and of sufficiently low cost to support widespread deployment and can be worn, carried, or moved easily to address potential threats. The objectives of the HPRDS program are to provide more capable and flexible systems to address numerous types of conveyances and cargo to be scanned for rad/nuc material.

Detection Capability Assessments: The Detection Capability Assessments program continually assesses the Global Nuclear Detection Architecture. The program uses a variety of means to identify the effectiveness of planned and deployed programs and operations. Some of the methods are test and evaluation of available and emerging technologies; execution of concept of operations pilots; and red team assessments to deepen the understanding of deployed capabilities.

Nuclear Forensics: The Nuclear Forensics program ensures the operational readiness of the federal nuclear forensics capability to

respond to an event without warning. The program leads the centralized planning, interagency efforts, exercises, assessments, and stewardship of the Nation's nuclear forensics capabilities through collaboration with federal departments and agencies who have assigned responsibilities for nuclear forensics. In addition to the Department of Homeland Security, these include the Department of Justice, Federal Bureau of Investigation, Department of Defense, Department of Energy, Department of State, and the Office of the Director of National Intelligence.

Transformational Research and Development: The Transformational Research and Development program oversees research and development conducted by industry, national laboratories, and academic institutions to improve performance, cost, and operational capability of detectors and systems and to address gaps in the Global Nuclear Detection Architecture and national technical nuclear forensics capabilities. The program collaborates with other federal research and development agencies to coordinate these efforts and maximize efficiency.

Federal, State, Local, Territorial, and Tribal Support: The Federal, State, Local, Territorial, and Tribal Support program promotes capability development and sustainment, and fosters strong relationships with state, local, and tribal agency mission stakeholders by sponsored strategic engagements. The major elements of this program include the State and Local Stakeholder Working Group, Executive Steering Council, and Capabilities Integration projects. These activities support partnerships between the Department and the state and local community to strengthen rad/nuc detection capabilities in support of the Global Nuclear Detection Architecture.

Securing the Cities: The Securing the Cities 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 Global Nuclear Detection Architecture partner agencies to detect, analyze, and report nuclear and other radioactive materials out of regulatory control within their jurisdictions.

Mission Support: The Mission Support program provides enterprise leadership, management, and business administrative services that sustain the day-to-day back office operations. Key capabilities include managing the agency's performance, finances, workforce, physical and personnel security, acquisition of goods and services, information technology, property and assets, communications, legal affairs, and administration.

Component Contributions to Achieving Departmental Missions

The table below shows the alignment of the DNDO 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	
Mission Support	51%					49%
Architecture Planning and Analysis	100%					
Detection Capability Development	100%					
Large Scale Detection Systems	100%					
Human Portable Rad/Nuc Systems	100%					
Detection Capability Assessments	100%					
Nuclear Forensics	100%					
Transformational Research and Development	100%					
Federal, State, Local, Territorial, and Tribal Support	100%					
Securing the Cities	100%					

**Totals account for rounding*

Mission 1: Prevent Terrorism and Enhance Security

Resources Requested

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

$ in thousands

Program Name	FY 2016 Revised Enacted		FY 2017 Annualized CR		FY 2018 President's Budget	
	$	FTE	$	FTE	$	FTE
Architecture Planning and Analysis	15,758	-	15,578	-	15,937	-
Detection Capability Development	21,029	-	20,788	-	15,155	-
Large Scale Detection Systems	51,269	-	53,096	-	62,524	-
Human Portable Rad/Nuc Systems	37,020	-	34,000	-	24,572	-
Detection Capability Assessments	39,503	-	39,051	-	34,127	-
Nuclear Forensics	19,031	-	18,813	-	18,361	-
Transformational Research and Development	64,684	-	63,943	-	60,581	-
Federal, State, Local, Territorial, and Tribal Support	26,168	-	25,560	-	23,384	-
Securing the Cities	21,113	-	21,135	-	21,135	-
Mission Support	26,485	70	26,353	70	27,732	73
Total	322,060	70	318,317	70	303,508	73

Performance Measures

For *Prevent Terrorism and Enhance Security*, two types of performance measures are presented. Strategic Measures represent DNDO 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 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, and 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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	N/A	23.0	23.0	37.0	37.0	46.0
Result:	N/A	23.0	23.0	37.0	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 prevent nuclear and other radioactive materials that are out of regulatory control from entering the country via cargo conveyances.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
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 prevent nuclear and other radioactive materials that are out of regulatory control from entering into the country via cargo containers at sea ports of entry.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	23	65	65	45	45	50
Result:	42	48	48	53	N/A	N/A

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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	61	110	144	164	164	162
Result:	106	161	248	266	N/A	N/A

Measure: Number of undergraduate, graduate, and post-doctorate fellowships and internships, early-career 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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	63	65	51	51	51	51
Result:	71	72	76	72	N/A	N/A

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 prevent nuclear and other radioactive materials that are out of regulatory control from entering the country via air cargo and mail.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
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 reports 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 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	95%	95%	95%	95%	95%	95%
Result:	63%	79%	36%	88%	N/A	N/A

Measure: Percent of Research & Development program and project milestones successfully achieved						
Description: This measure will gauge how well Research and Development program and project activities and their progress milestones are executed by DNDO's Transformational and Applied Research Directorate against numerous types of projects that are planned for and budgeted each year. A steady or slightly increasing number of milestones met is an indicator of effective program management.						
Fiscal Year:	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**
Target:	N/A	N/A	N/A	N/A	95%	95%
Result:	N/A	N/A	N/A	N/A	N/A	N/A

Mature and Strengthen Homeland Security

Resources Requested

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

$ in thousands

Program Name	**FY 2016 Revised Enacted**		**FY 2017 Annualized CR**		**FY 2018 President's Budget**	
	$	FTE	$	FTE	$	FTE
Mission Support	24,976	67	23,742	67	26,932	71
Total	24,976	67	23,742	67	26,932	71

Performance Measures

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

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Domestic Nuclear Detection Office
Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Operations and Support	137	137	$51,461	137	137	$50,095	158	144	$54,664	21	7	$4,569
Procurement, Construction, and Improvements	-	-	$88,289	-	-	$87,096	-	-	$87,096	-	-	-
Research and Development	-	-	$160,005	-	-	$158,173	-	-	$144,161	-	-	($14,012)
Federal Assistance	-	-	$47,281	-	-	$46,695	-	-	$44,519	-	-	($2,176)
Total	**137**	**137**	**$347,036**	**137**	**137**	**$342,059**	**158**	**144**	**$330,440**	**21**	**7**	**($11,619)**
Subtotal Discretionary - Appropriation	137	137	$347,036	137	137	$342,059	158	144	$330,440	21	7	($11,619)

The Domestic Nuclear Detection Office (DNDO) requests $330.440 million, 158 positions, and 144 FTEs in FY 2018.
DNDO leads the development of the Global Nuclear Detection Architecture (GNDA), implements its domestic portion, and leads the integration of United States Government technical nuclear forensics capabilities. The FY 2018 request funds activities to protect the United States from radiological/nuclear (R/N) terrorism by developing, acquiring, and deploying detection technologies, supporting operational law enforcement and homeland security partners, and by integrating technical nuclear forensic programs and advancing the state-of-the-art in nuclear forensics technologies. To address gaps in the GNDA and dramatically improve the performance of R/N detection and technical nuclear forensics technologies, the request also funds basic, applied, and developmental research to identify, explore, develop, and demonstrate innovative technologies. As part of the effort to foster and maintain expertise in specialized technical fields related to nuclear detection and forensics, the request supports academic programs, scholarships, and fellowships to advance research and encourage students in these fields of study. The request supports DNDO efforts to increase effectiveness of deployed technology through improved operational concepts and work with mission partners to ensure that R/N detection capabilities provide the greatest level of protection possible through multiple layers of defense.
The request for R/N detection equipment programs provides $62.5 million for large scale detection systems to ensure sustainment of the capability to scan virtually all containerized cargo entering the Nation and $24.6 million for the requirements for human portable equipment for DHS operational Components. The request also includes $21.1 million for the Securing the Cities program, which seeks to reduce the risk of a successful deployment of a R/N terrorist weapon against major metropolitan regions in the United States.

Domestic Nuclear Detection Office
Comparison of Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$347,120		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	($84)		
Revised Enacted/Request	**$347,036**	**$342,059**	**$330,440**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$81,814	$51,471	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$428,850**	**$393,530**	**$330,440**
Collections – Reimbursable Resources	$50	-	-
Total Budget Resources	**$428,900**	**$393,530**	**$330,440**
Obligations (Actual/Projections/Estimates)	$374,109	$393,530	$330,440
Personnel: Positons and FTE			
Enacted/Request Positions	137	137	158
Enacted/Request FTE	137	137	144
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	122	137	158
FTE (Actual/Estimates/Projections)	122	137	144

DNDO utilizes a multi-year planning and review process to establish program budgets, execution plans and when making adjustments during execution. Budgets and program plans are informed by risk analysis, Component and mission requirements, and program performance. Historically, DNDO has obligated more than 95% of the funds in the year appropriated, with exceptions occurring lately due to preparations for migration to a new financial management solution, difficulties associated with the implementation and operation of the new system, and delays due to acquisition decisions. Obligation rates for FY 2018 are estimated based on a return to DNDO's historical performance efficiency and completion of several acquisition programs.

Domestic Nuclear Detection Office
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Operations and Support	137	137	$24,040	$175.47	137	137	$23,796	$173.69	158	144	$25,129	$174.51	21	7	$1,333	$0.82
Total	**137**	**137**	**$24,040**	**$175.47**	**137**	**137**	**$23,796**	**$173.69**	**158**	**144**	**$25,129**	**$174.51**	**21**	**7**	**$1,333**	**$0.82**
Discretionary - Appropriation	137	137	$24,040	$175.47	137	137	$23,796	$173.69	158	144	$25,129	$174.51	21	7	$1,333	$0.82

The FY 2018 budget request reflects an increase to DNDO's FTE count from position conversions and hiring to fill an unexpected growth of vacancies occurring in late FY 2016 and hiring delays in 2017. Conversions focused on staffing to address the most critical vulnerabilities in business areas where "Closely Associated with Inherently Governmental Functions" were performed by contractors. These positions enable DNDO to strengthen oversight of research and development, acquisition, financial management, and information technology

DNDO has used the Balanced Workforce Strategy (specifically, the Balanced Workforce Assessment Tool (BWAT)) to comprehensively evaluate DNDO staffing. Over that time frame (2014 to present), DNDO has assessed positions that should be converted. In applying the results of the BWAT to determine which contractor positions to convert, activities such as providing oversight of government contracts, payment of invoices and access to other proprietary contractual data, and responding to Congressional inquiries were determined to be inherently or closely associated with inherently governmental work and were identified for conversion. Compared to the FY 2017 Annualized CR, the FY 2018 request includes an increase of 21 positions. This increase is a combination of filling positions that have been recently vacated through attrition and contractor slots that have been identified for conversion to federal positions.

The change reflects an increase of $940,000 for the conversion of 7 FTE and 21 positions; a decrease of $65,000 in SES bonuses and performance awards; and $458,000 for pay inflation.

Domestic Nuclear Detection Office
Pay by Object Class

Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$18,191	$18,017	$19,090	$1,073
11.5 Other Personnel Compensation	$275	$315	$250	($65)
12.1 Civilian Personnel Benefits	$5,574	$5,464	$5,789	$325
Total - Personnel Compensation and Benefits	**$24,040**	**$23,796**	**$25,129**	**$1,333**
Positions and FTE				
Positions - Civilian	137	137	158	21
FTE - Civilian	137	137	144	7

The FY 2018 request reflects an increase in personnel compensation reflecting the conversion of 7 FTE and 21 positions, and backfilling unexpected vacancies; as well as accounting for pay inflation.

Domestic Nuclear Detection Office
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Operations and Support	$27,421	$26,299	$29,535	$3,236
Procurement, Construction, and Improvements	$88,289	$87,096	$87,096	-
Research and Development	$160,005	$158,173	$144,161	($14,012)
Federal Assistance	$47,281	$46,695	$44,519	($2,176)
Total	**$322,996**	**$318,263**	**$305,311**	**($12,952)**
Discretionary - Appropriation	$322,996	$318,263	$305,311	($12,952)

DNDO balanced program requirements while supporting the FY 2018 President's Budget. The decrease from FY 2017 to FY 2018 is due to program decreases in Architecture Planning and Analysis, Detection Capability Assessments, Detection Capability Development, Nuclear Forensics, Transformational Research and Development, and Federal, State, Local, Territorial, and Tribal Support.

Domestic Nuclear Detection Office
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$927	$1,115	$1,351	$236
23.1 Rental Payments to GSA	$5,151	$5,151	$5,875	$724
24.0 Printing and Reproduction	$27	$22	$23	$1
25.1 Advisory and Assistance Services	$66,290	$59,194	$66,233	$7,039
25.2 Other Services from Non-Federal Sources	$647	$1,507	$855	($652)
25.3 Other Goods and Services from Federal Sources	$85,824	$90,400	$78,513	($11,887)
25.5 Research and Development Contracts	$56,433	$58,924	$48,389	($10,535)
25.7 Operation and Maintenance of Equipment	$389	$367	$370	$3
26.0 Supplies and Materials	$6,784	$4,505	$157	($4,348)
31.0 Equipment	$67,758	$68,255	$73,755	$5,500
41.0 Grants, Subsidies, and Contributions	$32,766	$28,823	$29,790	$967
Total - Non Pay Object Classes	**$322,996**	**$318,263**	**$305,311**	**($12,952)**

The changes reflect program requirements and a FY 2017 assessment of expenditure types used by DNDO and the definitions in OMB Circular A-11. The reduction to supplies and materials and increase in equipment is associated with a change in how Human Portable R/N Detection Equipment is accounted for in the accounting system as the equipment moves from acquisition, through inventory, and in most cases, transfers to other Components. The increase in rental payments to GSA reflects the delay in moving to the St. Elizabeths campus. The reductions to other goods and services from federal sources and research and development contracts are also associated with the program decreases in Architecture Planning and Analysis, Detection Capability Assessments, Detection Capability Development, Nuclear Forensics, Transformational Research and Development, and Federal, State, Local, Territorial, and Tribal Support.

Domestic Nuclear Detection Office
Supplemental Budget Justification Exhibits

Working Capital Fund

Dollars in Thousands

Appropriation and PPA	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget
Operations and Support	**$13,791**	**$9,904**	**$10,499**
Mission Support	$13,791	$9,904	$10,499
Total Working Capital Fund	**$13,791**	**$9,904**	**$10,499**

The DHS WCF provides for many shared services that the components rely on to execute their missions, such as rent and the DHS-wide IT infrastructure. Funds provided within the Mission Support PPA are used to acquire DHS WCF services, which include: IT support, human resources, and other services. The WCF also provides consolidated subscriptions, government-wide mandated services, and DHS crosscutting activities.

Domestic Nuclear Detection Office
Status of Congressionally Requested Studies, Reports and Evaluations

Fiscal Year	Due Date	Reference/Citation	Requirement	Status
FY 2016	2/1/2016	Public Law 114-113 Joint Explanatory Statement, p. 15	**Component Obligation Plans – Q1** Obligation plans from each DHS component shall be provided to the Committees within 45 days of the date of enactment of this Act, with updates provided not later than 30 days after the end of each quarter.	Submitted
FY 2016	5/2/2016	Public Law 114-113 Joint Explanatory Statement, p. 15	**Component Obligation Plans – Q2** Obligation plans from each DHS component shall be provided to the Committees within 45 days of the date of enactment of this Act, with updates provided not later than 30 days after the end of each quarter.	Submitted
FY 2016	7/30/2016	Public Law 114-113 Joint Explanatory Statement, p. 15	**Component Obligation Plans – Q3** Obligation plans from each DHS component shall be provided to the Committees within 45 days of the date of enactment of this Act, with updates provided not later than 30 days after the end of each quarter.	Submitted
FY 2016	10/30/2016	Public Law 114-113 Joint Explanatory Statement, p. 15	**Component Obligation Plans – Q4** Obligation plans from each DHS component shall be provided to the Committees within 45 days of the date of enactment of this Act, with updates provided not later than 30 days after the end of each quarter.	Submitted
FY 2016	3/31/2016	Section 1907 of the Homeland Security Act of 2002 (6 U.S.C. 101 et seq.) as added by Section 1103 of the Implementing Recommendations of the 9/11 Commission Act of 2007(P.L. 110-53), p. 379	**Global Nuclear Detection Architecture Joint Annual Interagency Review** (a) ANNUAL REVIEW.— (1) IN GENERAL.—The Secretary, the Attorney General, the Secretary of State, the Secretary of Defense, the Secretary of Energy, and the Director of National Intelligence shall jointly ensure interagency coordination on the development and implementation of the global nuclear detection architecture by ensuring that, not less frequently than once each year— (A) each relevant agency, office, or entity— (i) assesses its involvement, support, and participation in the development, revision, and implementation of the global nuclear detection architecture; and (ii) examines and evaluates components of the global nuclear detection architecture (including associated strategies and acquisition plans) relating to the operations of that agency, office, or entity, to determine whether such components incorporate and address current threat assessments, scenarios, or intelligence analyses developed by the Director of National Intelligence or other agencies regarding threats relating to nuclear or radiological weapons of mass destruction; and (B) each agency, office, or entity deploying or operating any nuclear or radiological detection technology under the global nuclear detection architecture—	Submitted

Fiscal Year	Due Date	Reference/Citation	Requirement	Status
			(i) evaluates the deployment and operation of nuclear or radiological detection technologies under the global nuclear detection architecture by that agency, office, or entity; (ii) identifies performance deficiencies and operational or technical deficiencies in nuclear or radiological detection technologies deployed under the global nuclear detection architecture; and (iii) assesses the capacity of that agency, office, or entity to implement the responsibilities of that agency, office, or entity under the global nuclear detection architecture. (2) TECHNOLOGY.—Not less frequently than once each year, the Secretary shall examine and evaluate the development, assessment, and acquisition of radiation detection technologies deployed or implemented in support of the domestic portion of the global nuclear detection architecture. (b) ANNUAL REPORT ON JOINT INTERAGENCY REVIEW.— (1) IN GENERAL.—Not later than March 31 of each year, the Secretary, the Attorney General, the Secretary of State, the Secretary of Defense, the Secretary of Energy, and the Director of National Intelligence, shall jointly submit a report regarding the implementation of this section and the results of the reviews required under subsection (a) to— (A) the President; (B) the Committee on Appropriations, the Committee on Armed Services, the Select Committee on Intelligence, and the Committee on Homeland Security and Governmental Affairs of the Senate; and (C) the Committee on Appropriations, the Committee on Armed Services, the Permanent Select Committee on Intelligence, the Committee on Homeland Security, and the Committee on Science and Technology of the House of Representatives. 2) FORM.—The annual report submitted under paragraph (1) shall be submitted in unclassified form to the maximum extent practicable, but may include a classified annex. (c) DEFINITION.—In this section, the term ‘global nuclear detection architecture’ means the global nuclear detection architecture developed under section 1902.	
FY 2016	3/31/2016	Section 1036 of the National Defense Authorization Act for Fiscal Year 2010 (P.L. 111-84) (Oct. 28, 2009), p. 2450	**Joint Interagency Annual Review of the National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States**	Submitted

Fiscal Year	Due Date	Reference/Citation	Requirement	Status
			NATIONAL STRATEGIC FIVE-YEAR PLAN FOR IMPROVING THE NUCLEAR FORENSIC AND ATTRIBUTION CAPABILITIES OF THE UNITED STATES. (a) IN GENERAL. The President, with the participation of the officials specified in subsection (c), shall develop a national strategic plan for improving over a five-year period the nuclear forensic and attribution capabilities of the United States and the methods, capabilities, and capacity for nuclear materials forensics and attribution. (b) ELEMENTS.—The plan required under subsection (a) shall include the following: (1) An investment plan to support nuclear materials forensics and attribution. (2) Recommendations with respect to— (A) the allocation of roles and responsibilities for predetonation, detonation, and post-detonation activities; and (B) methods for the attribution of nuclear or radiological material to the source when such material is intercepted by the United States, foreign governments, or international bodies or is dispersed in the course of a terrorist attack or other nuclear or radiological explosion. (c) OFFICIALS.—The officials specified in this subsection are the following: (1) The Secretary of Homeland Security. (2) The Secretary of Defense. (3) The Secretary of Energy. (4) The Attorney General. (5) The Secretary of State. (6) The Director of National Intelligence. (7) Such other officials as the President considers appropriate. (d) SUBMITTAL TO CONGRESS.—Not later than 180 days after the date of the enactment of this Act, the President shall submit to Congress the plan required under subsection (a).	

Fiscal Year	Due Date	Reference/Citation	Requirement	Status
FY 2017	3/31/2017	Section 1907 of the Homeland Security Act of 2002 (6 U.S.C. 101 et seq.) as added by Section 1103 of the Implementing Recommendations of the 9/11 Commission Act of 2007(P.L. 110-53), p. 379	Global Nuclear Detection Architecture Joint Annual Interagency Review	Submitted
FY 2017	3/31/2017	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	Submitted

Domestic Nuclear Detection Office
Authorized/Unauthorized Appropriations

Dollars in Thousands

Budget Activity	Last year of Authorization	Authorized Level	Appropriation in Last Year of Authorization	FY 2018 President's Budget
	Fiscal Year	Amount	Amount	Amount
Operations and Support				**$54,664**
Mission Support				$54,664
Procurement, Construction, and Improvements				**$87,096**
Large Scale Detection Systems				$62,524
Human Portable Rad/Nuc Systems				$24,572
Research and Development				**$144,161**
Architecture Planning and Analysis				$15,937
Transformational Research and Development				$60,581
Detection Capability Development				$15,155
Detection Capability Assessments				$34,127
Nuclear Forensics				$18,361
Federal Assistance				**$44,519**
Federal, State, Local, Territorial, and Tribal Support				$23,384
Securing the Cities				$21,135
Total Direct Authorization/Appropriation				**$330,440**

The SAFE Port Act of 2006, (P.L. 109-347) authorizing the creation of DNDO did not specify funding levels for DNDO.

Domestic Nuclear Detection Office
Proposed Legislative Language

Operation and Support

For necessary expenses of the **[**Chemical, Biological, Radiological, Nuclear and Explosives**]***Domestic Nuclear Detection* Office *for operations and support, as authorized by title XIX of the Homeland Security Act of 2002 (6 U.S.C. 591 et seq.),* **[**$180,033,000**]***$54,664,000***[**, 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
[Chemical, Biological, Radiological, Nuclear and Explosives**]***Domestic Nuclear Detection* Office *for operations and support as authorized by title XIX of the Homeland Security Act of 2002 (6 U.S.C. 591 et seq.)*	Chemical, Biological, Radiological, Nuclear, and Explosives Office not requested in FY 2018. Proposed language is for the Domestic Nuclear Detection Office.
[$180,033,000**]***$54,664,000*	Dollar change only.
[, 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**]**	Chemical, Biological, Radiological, Nuclear, and Explosives Office not requested in FY 2018.

Procurement, Construction, and Improvements

For necessary expenses of the **[**Chemical, Biological, Radiological, Nuclear, and Explosives**]***Domestic Nuclear Detection* Office *for procurement, construction, and improvements,* **[**$103,860,000**]***$87,096,000*, to remain available until September 30, **[**2019**]***2020.***[**, for programs and operations in support of the detection, forensics, and prevention of radiological and nuclear threats.**]**

Language Provision	Explanation
[Chemical, Biological, Radiological, Nuclear, and Explosives**]***Domestic Nuclear Detection* Office *for procurement, construction, and improvements,*	Chemical, Biological, Radiological, Nuclear, and Explosives Office not requested in FY 2018. Proposed language is for the Domestic Nuclear Detection Office.
[$103,860,000**]***$87,096,000*	Dollar change only.
[2019**]***2020*	Updated period of availability.
[, for programs and operations in support of the detection, forensics, and prevention of radiological and nuclear threats.**]**	Removed unnecessary language for consistency.

Research and Development

For necessary expenses of the **[**Chemical, Biological, Radiological, Nuclear, and Explosives**]***Domestic Nuclear Detection* Office *for research and development,***[**,$151,605,000**]***$144,161,000*, to remain available until September 30, **[**2019**]***2020.* **[**, for research programs and operations in support of the detection, forensics, and prevention of radiological and nuclear threats.**]**

Language Provision	Explanation
[Chemical, Biological, Radiological, Nuclear, and Explosives**]***Domestic Nuclear Detection* Office *for research and development*	Chemical, Biological, Radiological, Nuclear, and Explosives Office not requested in FY 2018. Proposed language is for the Domestic Nuclear Detection Office.
[,$151,605,000**]***$144,161,000*	Dollar change only.
[2019**]***2020*	Updated period of availability.
[, for research programs and operations in support of the detection, forensics, and prevention of radiological and nuclear threats.**]**	Removed unnecessary language for consistency.

Federal Assistance

For necessary expenses of the **[**Chemical, Biological, Radiological, Nuclear, and Explosives**]***Domestic Nuclear Detection* Office *for Federal assistance through grants, contracts, cooperative agreements, and other activities,* **[**$65,947,000**]***$44,519,000,* **[**of which $51,684,000,**]** to remain available until September 30, **[**2019**]***2020.* **[**, 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
[Chemical, Biological, Radiological, Nuclear, and Explosives**]***Domestic Nuclear Detection* Office *for Federal assistance through grants, contracts, cooperative agreements, and other activities*	Chemical, Biological, Radiological, Nuclear, and Explosives Office not requested in FY 2018. Proposed language is for the Domestic Nuclear Detection Office.
[$65,947,000**]***$44,519,000*	Dollar change only.
[of which $51,684,000,**]**	Removed unnecessary language for consistency.
[2019**]***2020*	Updated period of availability.
[, 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.**]**	Removed unnecessary language for consistency.

Domestic Nuclear Detection Office
Reimbursable Resources

Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Change		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Homeland Security - Transportation Security Administration	**Source**	-	-	$50	-	-	-	-	-	-	-	-	-
Federal Assistance	Location	-	-	$50	-	-	-	-	-	-	-	-	-
Federal, State, Local, Territorial, and Tribal Support	Location	-	-	$50	-	-	-	-	-	-	-	-	-
Total Collections		-	-	**$50**	-	-	-	-	-	-	-	-	-

Reimbursable resources are used for training TSA Federal teams regarding Preventative Radiological/Nuclear Detection (PRND) Mission. In FY 2016, DNDO provided TSA with two PRND course and received reimbursement for this service.

Department of Homeland Security

Domestic Nuclear Detection Office

Operations and Support

Fiscal Year 2018
Congressional Justification

Table of Contents

Operations and Support

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Mission Support	137	137	$51,461	137	137	$50,095	158	144	$54,664	21	7	$4,569
Total	**137**	**137**	**$51,461**	**137**	**137**	**$50,095**	**158**	**144**	**$54,664**	**21**	**7**	**$4,569**
Subtotal Discretionary - Appropriation	137	137	$51,461	137	137	$50,095	158	144	$54,664	21	7	$4,569

FY2016 Funding is shown in notional Common Appropriation Structure for comparison purposes.
Notional FY 2016 Enacted funding for Mission Support was $51.545 million. FY 2016 Revised Enacted reflects an $0.084 million rescission of prior year unobligated balances."

Overview

The Domestic Nuclear Detection Office (DNDO) is the United States Government (USG) lead agency charged with development of the Global Nuclear Detection Architecture (GNDA) and the implementation of its domestic portion, as well as with coordination and stewardship of the USG National Technical Nuclear Forensics (NTNF) enterprise. DNDO works closely with Federal, state, local, tribal, territorial, international, academic, national laboratory, and private sector partners. Functions include integrating interagency efforts to develop and acquire radiological and nuclear (R/N) detection technologies, evaluating detector performance, ensuring effective response to detection alarms, training and helping partners plan their GNDA contributions, integrating and ensuring readiness of U.S. nuclear forensics capabilities, conducting transformational research and development for R/N detection and forensics technologies, and reporting progress to external stakeholders. For both the detection and forensics missions, the likelihood of success is maximized by utilizing and employing appropriate technologies, well-trained law enforcement, and intelligence capabilities.

DNDO works to protect the United States from R/N terrorism by developing, acquiring, and deploying detection technologies, supporting operational law enforcement and homeland security partners, and by integrating technical nuclear forensic programs and advancing the state-of-the-art in nuclear forensics technologies. To address gaps in the GNDA and dramatically improve the performance of R/N detection and technical nuclear forensics technologies, DNDO also invests in basic, applied, and developmental research to identify, explore, develop, and demonstrate innovative technologies. As part of the effort to foster and maintain expertise in specialized technical fields related to nuclear detection and forensics, DNDO supports academic programs, scholarships, and fellowships to advance research and encourage students in these fields of study. DNDO seeks to increase effectiveness of deployed technology through improved operational concepts and works with mission partners to ensure that R/N detection capabilities provide the greatest level of protection possible through multiple layers of defense.

The Operations and Support (O&S) appropriation supports the costs incurred for the day-to-day operation and maintenance of the organization, including, but not limited to, salaries, services, supplies, utilities, travel, training, and transportation, as well as minor procurement, construction, and improvement projects. O&S includes the following Programs, Projects, or Activities (PPAs).

- **Mission Support:** Captures activities that provide enterprise leadership, management and business administration services and includes the capabilities and activities that support the day-to-day management and back office functions that enable the Domestic Nuclear Detection Office to operate efficiently and effectively. Key capabilities include strategic direction, the 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.

Operations and Support
Budget Authority and Obligations
Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$51,545		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	($84)		
Revised Enacted/Request	**$51,461**	**$50,095**	**$54,664**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$51,461**	**$50,095**	**$54,664**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$51,461**	**$50,095**	**$54,664**
Obligations (Actual/Projections/Estimates)	$51,522	$50,095	$54,664
Personnel: Positons and FTE			
Enacted/Request Positions	137	137	158
Enacted/Request FTE	137	137	144
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	122	137	158
FTE (Actual/Estimates/Projections)	122	137	144

FY2016 Funding is shown in notional Common Appropriation Structure for comparison purposes.

Operations and Support
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**137**	**137**	**$51,545**
FY 2016 Rescission of Prior Year Appropriation	-	-	($84)
Total Rescissions	**-**	**-**	**($84)**
FY 2016 Revised Enacted	**137**	**137**	**$51,461**
FY 2017 Annualized CR	**137**	**137**	**$50,095**
FY 2018 Base Budget	**137**	**137**	**$50,095**
Transfer from Detection Capability Assessments due to CAS Realignment	-	-	$3,474
Transfer to A&O from DNDO due to A&O WCF Activity Costs Removal	-	-	($9)
Transfer to OSEM/OGC from DNDO due to OGC WCF Activity Costs Removal	-	-	($1)
Transfer to USM/CHCO from DNDO due to CHCO WCF Activity Costs Removal	-	-	($35)
Transfer to USM/CIO from DNDO due to CIO WCF Activity Costs Removal	-	-	($426)
Transfer to USM/CPO from DNDO due to CPO WCF Activity Costs Removal	-	-	($20)
Transfer to USM/CRSO from DNDO due to CRSO WCF Activity Costs Removal	-	-	($92)
Transfer to USM/CSO from DNDO due to CSO WCF Activity Costs Removal	-	-	($5)
Total Transfers	**-**	**-**	**$2,886**
DHS Balanced Workforce Strategy	21	7	$940
FY17 Annualized Pay Raise	-	-	$123
FY18 Pay Raise	-	-	$335
GSA Rent	-	-	$724
Total, Pricing Increases	**21**	**7**	**$2,122**
Reduced Contractor Support	-	-	($439)
Total, Pricing Decreases	**-**	**-**	**($439)**
Total Adjustments-to-Base	**21**	**7**	**$4,569**
FY 2018 Current Services	**158**	**144**	**$54,664**
FY 2018 Request	**158**	**144**	**$54,664**
FY 2017 TO FY 2018 Change	**21**	**7**	**$4,569**

*FY2016 Funding is shown in notional Common Appropriation Structure for comparison purposes.

Operations and Support
Justification of Pricing Changes

Dollars in Thousands

Pricing Changes	FY 2018 President's Budget		
	Positions	FTE	Amount
Pricing Change 1 - DHS Balanced Workforce Strategy	**21**	**7**	**$940**
Mission Support	21	7	$940
Pricing Change 2 - FY17 Annualized Pay Raise	**-**	**-**	**$123**
Mission Support	-	-	$123
Pricing Change 3 - FY18 Pay Raise	**-**	**-**	**$335**
Mission Support	-	-	$335
Pricing Change 4 - GSA Rent	**-**	**-**	**$724**
Mission Support	-	-	$724
Pricing Change 5 - Reduced Contractor Support	**-**	**-**	**($439)**
Mission Support	-	-	($439)
Total Pricing Changes	**21**	**7**	**$1,683**

FY17 Annualized Pay Raise: Increase in personnel compensation and benefits for the first quarter of fiscal year 2018 of $123,000.

FY18 Pay Raise: Increase in personnel compensation and benefits for the second through fourth quarters of fiscal year 2018 of $335,000.

DHS Balanced Workforce Strategy: Position conversions to balance workforce composition. These conversions focused on staffing to address the most critical vulnerabilities in business areas where "Nearly Inherent Government Functions" are performed by Federal employees.

GSA Rent: Increase in rent due to delays in moving to the St. Elizabeths campus.

Reduced Contractor Support: Reduction in contractor support due to requested position conversions.

Operations and Support
Personnel Compensation and Benefits
Pay Summary
Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Mission Support	137	137	$24,040	$175.47	137	137	$23,796	$173.69	158	144	$25,129	$174.51	21	7	$1,333	$0.82
Total	**137**	**137**	**$24,040**	**$175.47**	**137**	**137**	**$23,796**	**$173.69**	**158**	**144**	**$25,129**	**$174.51**	**21**	**7**	**$1,333**	**$0.82**
Discretionary - Appropriation	137	137	$24,040	$175.47	137	137	$23,796	$173.69	158	144	$25,129	$174.51	21	7	$1,333	$0.82

Pay by Object Class
Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$18,191	$18,017	$19,090	$1,073
11.5 Other Personnel Compensation	$275	$315	$250	($65)
12.1 Civilian Personnel Benefits	$5,574	$5,464	$5,789	$325
Total - Personnel Compensation and Benefits	**$24,040**	**$23,796**	**$25,129**	**$1,333**
Positions and FTE				
Positions - Civilian	137	137	158	21
FTE - Civilian	137	137	144	7

Operations and Support
Permanent Positions by Grade – Appropriation

Grades and Salary Range	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
Total, SES	8	8	9	1
Total, EX	1	1	1	-
GS-15	61	61	58	-3
GS-14	33	33	47	14
GS-13	21	21	30	9
GS-12	7	7	5	-2
GS-11	3	5	7	2
GS-9	2	-	-	-
GS-3	1	1	1	-
Total Permanent Positions	**137**	**137**	**158**	**21**
Unfilled Positions EOY	15	-	-	-
Total Perm. Employment (Filled Positions) EOY	122	137	158	21
Position Locations				
Headquarters	137	137	158	21
Averages				
Average Personnel Costs, ES Positions	177,000	182,082	188,686	6,604
Average Personnel Costs, GS Positions	124,000	130,145	128,092	-2,053
Average Grade, GS Positions	15	15	14	-1

Operations and Support
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Mission Support	$27,421	$26,299	$29,535	$3,236
Total	**$27,421**	**$26,299**	**$29,535**	**$3,236**
Discretionary - Appropriation	$27,421	$26,299	$29,535	$3,236

* FY2016 Funding is shown in notional Common Appropriation Structure for comparison purposes.

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$124	$105	$106	$1
23.1 Rental Payments to GSA	$5,151	$5,151	$5,875	$724
24.0 Printing and Reproduction	$27	$22	$23	$1
25.1 Advisory and Assistance Services	$9,034	$8,138	$11,288	$3,150
25.2 Other Services from Non-Federal Sources	$90	$163	$166	$3
25.3 Other Goods and Services from Federal Sources	$12,311	$11,978	$11,328	($650)
25.7 Operation and Maintenance of Equipment	$389	$367	$370	$3
26.0 Supplies and Materials	$146	$145	$147	$2
31.0 Equipment	$149	$230	$232	$2
Total - Non Pay Object Classes	**$27,421**	**$26,299**	**$29,535**	**$3,236**

*FY2016 Funding is shown in notional Common Appropriation Structure for comparison purposes.

Mission Support – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Mission Support	137	137	$51,461	137	137	$50,095	158	144	$54,664	21	7	$4,569
Total	**137**	**137**	**$51,461**	**137**	**137**	**$50,095**	**158**	**144**	**$54,664**	**21**	**7**	**$4,569**
Subtotal Discretionary - Appropriation	137	137	$51,461	137	137	$50,095	158	144	$54,664	21	7	$4,569

*FY2016 Funding is shown in notional Common Appropriation Structure for comparison purposes.

Mission Support – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$51,545		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	($84)		
Revised Enacted/Request	**$51,461**	**$50,095**	**$54,664**
Carryover and/or Recoveries (Actual/Estimates/Projections)	-	-	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$51,461**	**$50,095**	**$54,664**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$51,461**	**$50,095**	**$54,664**
Obligations (Actual/Projections/Estimates)	$51,522	$50,095	$54,664
Personnel: Positons and FTE			
Enacted/Request Positions	137	137	158
Enacted/Request FTE	137	137	144
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	122	137	158
FTE (Actual/Estimates/Projections)	122	137	144

*FY2016 Funding is shown in notional Common Appropriation Structure for comparison purposes.

Mission Support – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**137**	**137**	**$51,545**
FY 2016 Rescission of Prior Year Appropriation	-	-	($84)
Total Rescissions	**-**	**-**	**($84)**
FY 2016 Revised Enacted	**137**	**137**	**$51,461**
FY 2017 Annualized CR	**137**	**137**	**$50,095**
FY 2018 Base Budget	**137**	**137**	**$50,095**
Transfer from Detection Capability Assessments due to CAS Realignment	-	-	$3,474
Transfer to A&O from DNDO due to A&O WCF Activity Costs Removal	-	-	($9)
Transfer to OSEM/OGC from DNDO due to OGC WCF Activity Costs Removal	-	-	($1)
Transfer to USM/CHCO from DNDO due to CHCO WCF Activity Costs Removal	-	-	($35)
Transfer to USM/CIO from DNDO due to CIO WCF Activity Costs Removal	-	-	($426)
Transfer to USM/CPO from DNDO due to CPO WCF Activity Costs Removal	-	-	($20)
Transfer to USM/CRSO from DNDO due to CRSO WCF Activity Costs Removal	-	-	($92)
Transfer to USM/CSO from DNDO due to CSO WCF Activity Costs Removal	-	-	($5)
Total Transfers	**-**	**-**	**$2,886**
DHS Balanced Workforce Strategy	21	7	$940
FY17 Annualized Pay Raise	-	-	$123
FY18 Pay Raise	-	-	$335
GSA Rent	-	-	$724
Total, Pricing Increases	**21**	**7**	**$2,122**
Reduced Contractor Support	-	-	($439)
Total, Pricing Decreases	**-**	**-**	**($439)**
Total Adjustments-to-Base	**21**	**7**	**$4,569**
FY 2018 Current Services	**158**	**144**	**$54,664**
FY 2018 Request	**158**	**144**	**$54,664**
FY 2017 TO FY 2018 Change	**21**	**7**	**$4,569**

*FY2016 Funding is shown in notional Common Appropriation Structure for comparison purposes.

PPA Description

The Mission Support PPA captures activities that provide enterprise leadership, management, and business administration services and includes the capabilities and activities that support the day-to-day management functions that enable the Domestic Nuclear Detection Office to operate efficiently and effectively. Key capabilities include support to strategic direction and integration across DNDO-related activities, support to White House and interagency policy development and liaison, agency planning and performance management, financial management, workforce management, physical and personnel security, acquisition of goods and services, information technology management, agency property and asset management, communications management, legal affairs, and general management and administration.

The Mission Support PPA funds the administration of DNDO and provides for the execution of salaries, benefits, and expenses for all full-time equivalent/full-time permanent personnel. Funds are also provided to the Working Capital Fund, which provides such services as rent and information technology infrastructure support.

DNDO continues to examine and mature its implementation of the Common Appropriation Structure. As part of a review of program alignment, funds for information technology governance, infrastructure and cybersecurity were transferred from the Research and Development appropriation to the Mission Support PPA. Some information technology infrastructure capabilities have matured beyond development and DNDO considers these activities best aligned to Operations and Support. DNDO relies on the Department and the Working Capital Fund for common information technology support, enterprise and data architecture guidance and direction. The funding transferred supports preparation of agreements to effectively share radiological/nuclear (R/N) detection information among Federal, state, local, tribal, and territorial partners, in order to prevent terrorism and enhance national security; and validates cybersecurity compliance and readiness of DNDO systems and safeguarding of DNDO sensitive information in third-party systems and services. The funding supports the evolution of technical competencies and expertise as well as tools and technologies which comprise DNDO's adaptive mission-support information technology infrastructure.

The Mission Support PPA includes funding for the DNDO Financial, Acquisition, and Asset Management Solution (FAAMS) Program, whose purpose is to operate a business management solution. FAAMS provides DNDO with procurement and asset management capabilities that integrate with the financial system of record. DNDO continues to work with the Department's Financial System Modernization program to implement and strive to achieve full operational capability.

Adjustments to Base Justification

- **FY 2017 Annualized Pay Raise:** Increase in personnel compensation and benefits for the first quarter of fiscal year 2018 of $123,000.

- **FY 2018 Pay Raise:** Increase in personnel compensation and benefits for the second through fourth quarters of fiscal year 2018 of $335,000.
- **DHS Balanced Workforce Strategy:** Position conversions to balance workforce composition. These conversions focused on staffing to address the most critical vulnerabilities in business areas where "Nearly Inherent Government Functions are performed by Federal employees.
- **GSA Rent:** Increase in rent due to delays in moving to the St. Elizabeths campus.
- **Reduced Contractor Support:** Reduction in contractor support due to requested position conversions.

Mission Support – PPA
Personnel Compensation and Benefits

Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted				FY 2017 Annualized CR				FY 2018 President's Budget				FY 2017 to FY 2018 Total Changes			
	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate	Pos.	FTE	Amount	Rate
Mission Support	137	137	$24,040	$175.47	137	137	$23,796	$173.69	158	144	$25,129	$174.51	21	7	$1,333	$0.82
Total	**137**	**137**	**$24,040**	**$175.47**	**137**	**137**	**$23,796**	**$173.69**	**158**	**144**	**$25,129**	**$174.51**	**21**	**7**	**$1,333**	**$0.82**
Discretionary - Appropriation	137	137	$24,040	$175.47	137	137	$23,796	$173.69	158	144	$25,129	$174.51	21	7	$1,333	$0.82

NARRATIVE EXPLANATION OF CHANGES

FTE Change FY 2017-2018: The FY 2018 budget request reflects an increase to DNDO's FTE count from position conversions and attrition of staff. These conversions focused on staffing to address the most critical vulnerabilities in business areas where "Closely Associated with Inherently Governmental Functions" were performed by contractors.

DNDO has used the Balanced Workforce Strategy (specifically, the Balanced Workforce Assessment Tool (BWAT)) to comprehensively evaluate DNDO staffing. Over that time frame (2014 to present), DNDO has assessed positions that should be converted. Compared to the FY 2017 Annualized CR, the FY 2018 request is an increase of 21 positions. In applying the results of the BWAT to determine which contractor positions to convert, activities such as providing oversight of government contracts, payment of invoices and access to other proprietary contractual data, and responding to Congressional inquiries were determined to be inherently or closely associated with inherently governmental work and were identified for conversion. This increase is a combination of filling positions that have been recently vacated through attrition and contractor slots that have been identified for conversion to federal positions.

PCB Change FY 2017-2018: The change reflects an increase of $940,000 for the conversion of 7 FTE; a decrease of $65,000 in SES bonuses and performance awards; and $458,000 for pay inflation.

Average Cost Change FY 2017-2018: The average cost change reflects pay inflation. The average cost change also reflects a projected reduction in average GS salary resulting from the grade structure changes due to position conversions.

Mission Support – PPA
Pay by Object Class
Dollars in Thousands

Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
11.1 Full-time Permanent	$18,191	$18,017	$19,090	$1,073
11.5 Other Personnel Compensation	$275	$315	$250	($65)
12.1 Civilian Personnel Benefits	$5,574	$5,464	$5,789	$325
Total - Personnel Compensation and Benefits	**$24,040**	**$23,796**	**$25,129**	**$1,333**
Positions and FTE				
Positions - Civilian	137	137	158	21
FTE - Civilian	137	137	144	7

Pay Cost Drivers
Dollars in Thousands

Leading Cost-Drivers	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate	FTE	Amount	Rate
Federal Employee Compensation and Benefits	137	$24,040	$175.47	137	$23,796	$173.69	144	$25,129	$174.51	7	$1,333	$0.81
Total – Pay Cost Drivers	**137**	**$24,040**	**$175.47**	**137**	**$23,796**	**$173.69**	**144**	**$25,129**	**$174.51**	**7**	**$1,333**	**$0.81**

As DNDO increases staffing to authorized levels in FY 2017, the rate per FTE is reduced as new employees are hired at lower than average grade and step levels. In FY 2018, with the proposed position conversions, DNDO reduced its average grade level from 15 to 14.

Mission Support – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Mission Support	$27,421	$26,299	$29,535	$3,236
Total	**$27,421**	**$26,299**	**$29,535**	**$3,236**
Discretionary - Appropriation	$27,421	$26,299	$29,535	$3,236

* FY2016 Funding is shown in notional Common Appropriation Structure for comparison purposes.

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$124	$105	$106	$1
23.1 Rental Payments to GSA	$5,151	$5,151	$5,875	$724
24.0 Printing and Reproduction	$27	$22	$23	$1
25.1 Advisory and Assistance Services	$9,034	$8,138	$11,288	$3,150
25.2 Other Services from Non-Federal Sources	$90	$163	$166	$3
25.3 Other Goods and Services from Federal Sources	$12,311	$11,978	$11,328	($650)
25.7 Operation and Maintenance of Equipment	$389	$367	$370	$3
26.0 Supplies and Materials	$146	$145	$147	$2
31.0 Equipment	$149	$230	$232	$2
Total - Non Pay Object Classes	**$27,421**	**$26,299**	**$29,535**	**$3,236**

*FY2016 Funding is shown in notional Common Appropriation Structure for comparison purposes.

Mission Support – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Advisory and Assistance Services	$9,034	$8,138	$11,288	$3,150
Working Capital Fund (excl. GSA Rent)	$8,640	$4,753	$4,624	($129)
GSA Rent	$5,151	$5,151	$5,875	$724
Financial, Acquisition, and Asset Management Solution	$3,172	$2,686	$1,963	($723)
Other Costs	$1,424	$5,571	$5,785	$214
Total – Non Pay Cost Drivers	**$27,421**	**$26,299**	**$29,535**	**$3,236**

NARRATIVE EXPLANATION OF CHANGES

Advisory and Assistance Services: The increase of $3.2 million in advisory and assistance contracts are attributed to the transfer of $3.5 million from the Detection Capability Assessments PPA. DNDO's Mission Support advisory and assistance contracts provide financial management, accounting services, workforce management, information technology management, agency property and asset management, and general management and administration support services.

Working Capital Fund (excluding GSA Rent): The DHS Working Capital Fund provides support services across the Department. The decrease is related to the activity cost removals from the Working Capital Fund.

GSA Rent: The increase of $0.7 million is due to delays in moving to the St. Elizabeths campus. This delay will require renegotiation or extension of the lease for DNDO's current location, resulting in an increase in rent.

Financial, Acquisition, and Asset Management Solution: The decrease of $0.7 million is reflective of the approved Life Cycle Cost Estimate for this business management solution.

Department of Homeland Security

Domestic Nuclear Detection Office

Procurement, Construction, and Improvements

Fiscal Year 2018
Congressional Justification

Table of Contents

Procurement, Construction, and Improvements
Budget Comparison and Adjustments
Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Large Scale Detection Systems	$51,269	$53,096	$62,524	$9,428
Human Portable Rad/Nuc Systems	$37,020	$34,000	$24,572	($9,428)
Total	**$88,289**	**$87,096**	**$87,096**	**-**
Discretionary - Appropriation	$88,289	$87,096	$87,096	-

FY 2016 Funding is shown in notional Common Appropriation Structure for comparison purposes

Overview

Procurement, Construction, and Improvements (PC&I) provides 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.

Unless otherwise stipulated by regulation or statute, the use of PC&I funding to purchase an end item, asset, or improvement project, is subject to the following funding thresholds:

a. as Personal Property, an end item unit cost of greater than $250,000, or

b. for Real Property, an end item unit cost of greater than $2 million.

In FY 2018, DHS OCFO approved an exception to the personal property threshold for assets procured through the Human Portable Radiological/Nuclear (R/N) Systems PPA to facilitate strategic management of DNDO's detection equipment portfolio.

PC&I funds are necessary to execute operations in support of the DNDO Large Scale Detection Systems and Human Portable Radiological/Nuclear Systems Investments.

DNDO's mission is to prevent nuclear terrorism by continuously improving capabilities to deter, detect, respond to, and attribute attacks, in coordination with domestic and international partners. DNDO supports this mission by funding the U.S. Government's (USG) Global Nuclear Detection Architecture (GNDA) development, its domestic implementation, as well as coordination and stewardship of USG technical nuclear forensics efforts. DNDO integrates interagency efforts to develop nuclear detection technologies, evaluate detector performance, and ensure effective response to detection alarms. Due to the dynamic nature of the

threat, acquisitions pertaining to R/N terrorism prevention are integrated through an agile detection architecture that can readily surge in response to intelligence cues. DNDO uses PC&I funding to acquire R/N detection equipment (RDE) for Department of Homeland Security (DHS) Components, including the U.S. Coast Guard (USCG), U.S. Customs and Border Protection (CBP), and the Transportation Security Administration (TSA). DNDO centrally manages and tracks those assets across their life cycle until a final system dispositioning decision has been made. Additionally, it supports state and local users with acquisition of RDE for the Mobile Detection Deployment Units (MDDU). Through strategic sourcing initiatives, DNDO is able to achieve efficiencies and better buying power for Department resources by centralizing and expanding the volume of RDE purchases as it supports multiple DHS Components.

Commercial First Approach: Recognizing the rapid advancement of technology and innovation, constrained budgets, and market forces, DNDO funding shifted from a focus on government-sponsored development of materiel solutions to one where commercially available off the shelf products are sought first – *Commercial First.* This change allows DNDO to leverage important industry-led innovations and technologies. Additionally, DNDO continues to foster open and transparent communications with industry partners to share publicly releasable aspects of future requirements and projected quantities of planned procurements.

The commercial first approach is based on the principle that all DNDO programs will first engage the private sector to determine whether or not adequate solutions exist to address capability gaps before pursuing time consuming and potentially costly new development initiatives. There are several commercial first pathways 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; and
- Government-sponsored development.

LARGE SCALE DETECTION SYSTEMS – PPA OVERVIEW

The Large Scale Detection Systems PPA includes resources to acquire and deploy fixed and mobile large scale RDE to support DHS operational end-users and address GNDA requirements. The PPA 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. DNDO coordinates with operational partners to refine and prioritize equipment requirements. The following table provides descriptions for the programs within this PPA.

Program	Project	Level of Effort	General Description
Radiation Portal Monitor Program	RPMP	Ongoing	RPMP is a post-Full Operating Capability (FOC) program with the objective to maintain scanning coverage at previously deployed sites. Major activities include: Decommission low-use/no-use RPMs and reconfigure sites as required; deploy new RPMs and redeploy previously decommissioned and refurbished RPMs as necessary to address required level of scanning capability at sites; deploy additional large-scale systems at ports of entry (POEs) or between POEs in the vicinity of the border; deploy improvements to fielded systems; and conduct test and evaluation of improvements.
RPM Replacement Program (RPM RP)	RPM RP	Ongoing	RPM RP is a level 2, post-Acquisition Decision Event (ADE) 2b program with the objective to acquire and deploy enhanced RPMs to begin to recapitalize the current fleet of fixed RPMs.
On Dock Rail (ODR) Program	ODR	Ongoing	ODR is a pre-ADE 3 program to provide more efficient scanning to detect and classify R/N threat sources in intermodal cargo containers transferred directly from ship to rail car.
International Rail (IRAIL) Program	IRAIL	Ongoing	IRAIL is a pre-ADE 2a program to detect and identify nuclear or other radioactive materials out of regulatory control entering the United States via freight rail.

Large Scale Detection Systems PPA Summary

Dollars in Thousands

Investment	Unique Acquisition Identifier	Acquisition Level	Procurement / Construction	IT / Non IT Investment	Major Acquisitions Oversight List	FY 2016 Revised Enacted	FY2017 Annualized CR	FY 2018 Request
Radiation Portal Monitor Program (RPMP)	N/A	Post FOC	Procurement	Non-IT	No	$44,329	$42,187	$33,773
Radiation Portal Monitor Replacement Program (RPM RP)	024-000005961	Level 2	Procurement	Non-IT	Yes	$4,000	$7,509	$26,751
On-Dock Rail (ODR)	N/A	Level 3	Procurement	Non-IT	No	$2,940	$3,400	$1,000
International Rail (IRAIL)	N/A	Level 3	Procurement	Non-IT	No	-	-	$1,000

HUMAN PORTABLE RADIOLOGICAL/NUCLEAR DETECTION SYSTEMS – PPA OVERVIEW

The Human Portable Rad/Nuc Detection Systems PPA includes resources to acquire and deploy human portable RDE that can be carried, worn, or easily moved by a user to support DHS operational end-users and address GNDA requirements. These devices play a critical role in the layered defenses of the United States against radiological or nuclear terrorist attacks. The portfolio consists of personal radiation detectors (PRD), handheld radioisotope identification devices (RIID), human portable tripwire (HPT), linear radiation monitors (LRM), radiation detection backpacks, and handheld radiation monitors (HRM). These systems are used to detect, localize, and/or identify radiological material. Most are relatively lightweight, easy to use, and of sufficiently low cost for widespread deployment.

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 2018, DNDO will continue recapitalization efforts to maintain current capability. This recapitalization through strategic sourcing will provide Department-wide cost savings by replacing older equipment, which would incur higher Operations and Maintenance (O&M) costs, with modernized equipment with greater capability and lower O&M costs. In FY 2016, technical issues with the new basic handheld devices did not allow DNDO to purchase additional units with FY 2016 funds. These funds were reallocated to other higher priority programs most notably the HPT program to accelerate the deployment of this new capability.

The following table provides descriptions for the programs within the HPRDS PPA.

Project	Level of Effort	General Description
Basic Handheld (BHH) RIID	Ongoing	The BHH RIID program is a post-ADE 3 program acquiring and deploying devices used for search, detection, localization, and identification of R/N materials, primarily in a secondary screening role.
Advanced Handheld (AHH) RIID	No planned 2018 procurements	The AHH RIID program is a post-ADE 3 program acquiring and deploying devices often used as the final arbiter in situations where superior capability for R/N detection and identification is required; they are also used in laboratory settings as reference detectors.
Personal Radiation Detectors (PRD)	Ongoing	The PRD program is a post-ADE 3 program acquiring and deploying pager-size devices used to detect R/N materials. PRDs are continuously worn by operators for detection and personal protection.
Human Portable Tripwire (HPT)	Ongoing	The HPT program is a pre-ADE 3 program acquiring and deploying small/wearable systems that provide next-generation capabilities to detect, identify, communicate, and adjudicate R/N threats.
Backpacks	Ongoing	The Radiation Detection Backpack program is a post-ADE 3 program acquiring and deploying backpack detectors used in situations where a wide-area R/N detection capability is necessary.
Linear Radiation Monitors (LRM) and Handheld Radiation Monitors (HRM)	No planned 2018 procurements	The LRM is designed in a rope configuration to be lowered into small spaces, such as in between large stacks of intermodal shipping containers. The HRM is used by USCG Maritime Security Response Teams during tactical operations to detect and locate a radiation threat. Both programs are post-ADE 3.

Human Portable Rad/Nuc Detection Systems PPA Summary

Dollars in Thousands

Investment	Unique Acquisition Identifier	Acquisition Level	Procurement / Construction	IT / Non IT Investment	Major Acquisitions Oversight List	FY 2016 Revised Enacted*	FY2017 Annualized CR	FY 2018 Request
Human Portable Radiation Detection Systems Portfolio						**$37,020**	**$34,000**	**$24,572**
Basic Handheld RIIDs	024-000005960	Level 3	Procurement	Non-IT	Yes	$1,845	$7,001	$8,877
Advanced Handheld RIIDs	N/A	Level 3	Procurement	Non-IT	No	$1,815	$5,244	-
PRD	024-000005959	Level 3	Procurement	Non-IT	Yes	$7,263	$7,363	$7,404
HPT	024-000005958	Level 3	Procurement	Non-IT	Yes	$19,933	$10,521	$3,685
Backpack Systems	N/A	Level 3	Procurement	Non-IT	No	$4,540	$3,871	$4,606
Other**	N/A	N/A	Procurement	Non-IT	No	$1,624	-	-

* In FY 2016, the PPAs for the Radiation Portal Monitor (RPM) Program and HPRDS Program were combined into a single PPA for RDE equipment; funding was allocated to the PPA level only.
** Other includes equipment such as Linear Radiation Monitors (LRM), Handheld Radiation Monitors (HRM), Source Kits, etc.

Procurement, Construction, and Improvements
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$88,289		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$88,289**	**$87,096**	**$87,096**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$44,631	$19,082	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$132,920**	**$106,178**	**$87,096**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$132,920**	**$106,178**	**$87,096**
Obligations (Actual/Projections/Estimates)	$114,818	$106,178	$87,096
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Procurement, Construction, and Improvements
Summary of Budget Changes
Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$88,289**
FY 2016 Revised Enacted	**-**	**-**	**$88,289**
FY 2017 Annualized CR	**-**	**-**	**$87,096**
FY 2018 Base Budget	**-**	**-**	**-**
Human Portable Radiation Detection Systems Portfolio	-	-	$24,572
International Rail	-	-	$1,000
On Dock Rail	-	-	$1,000
Radiation Portal Monitor Program	-	-	$33,773
Radiation Portal Monitor Replacement Program	-	-	$26,751
Total Investment Elements	**-**	**-**	**$87,096**
FY 2018 Request	**-**	**-**	**$87,096**
FY 2017 TO FY 2018 Change	**-**	**-**	**-**

Procurement, Construction, and Improvements
Non Pay Budget Exhibits

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
25.1 Advisory and Assistance Services	$5,146	$5,600	$6,319	$719
25.3 Other Goods and Services from Federal Sources	$8,929	$9,138	$7,300	($1,838)
26.0 Supplies and Materials	$6,638	$4,360	-	($4,360)
31.0 Equipment	$67,576	$67,998	$73,477	$5,479
Total - Non Pay Object Classes	**$88,289**	**$87,096**	**$87,096**	**-**

Procurement, Construction, and Improvements
Capital Investments Exhibits

Capital Investments

Dollars in Thousands

Investment	Unique Item Identifier	Acquisition Level	Procurement / Construction	IT/Non-IT	MAOL	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget
Large Scale Detection Systems	024-000005961	2	Procurement	Non-IT	Yes	$51,269	$53,096	$62,524
Human Portable Rad/Nuc Systems	-	3	Procurement	Non-IT	No	$37,020	$34,000	$24,572

Large Scale Detection Systems – Investment

Capital Investments Exhibits

Procurement/Acquisition Programs

Investment	Unique Item Identifier	Acquisition Level	Procurement / Construction	IT/Non-IT	MAOL	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget
Large Scale Detection Systems	024-000005961	2	Procurement	Non-IT	Yes	$51,269	$53,096	$62,524

The Large Scale Detection Systems PPA includes resources to acquire and deploy fixed and mobile large scale RDE to support DHS operational end-users and address GNDA requirements. This PPA 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. The following table provides a summary of the programs included in this PPA.

Investment	Unique Item Identifier	Acquisition Level	Procurement / Construction	IT / Non IT	MAOL	FY 2016 Revised Enacted	FY2017 Annualized CR	FY 2018 President's Budget
Large Scale Detection Systems			Procurement	Non-IT	Yes	**$51,269**	**$53,096**	**$62,524**
Radiation Portal Monitor Program (RPMP)	N/A	Post FOC	Procurement	Non-IT	No	$44,329	$42,187	$33,773
Radiation Portal Monitor Replacement Program (RPM RP)	024-000005961	Level 2	Procurement	Non-IT	Yes	$4,000	$7,509	$26,751
On-Dock Rail (ODR)	N/A	Level 3	Procurement	Non-IT	No	$2,940	$3,400	$1,000
International Rail (IRAIL)	N/A	Level 3	Procurement	Non-IT	No	-	-	$1,000

Large Scale Equipment	FY 2018 Planned Procurement Units
Radiation Portal Monitor	0 units procured in FY18
RPM RP	9 RPMs procured in FY18
On Dock Rail	0 units procured in FY18
International Rail	1 unit procured in FY18

Radiation Portal Monitor (RPM) Program

Procurement, Construction, and Improvements Funding

Investment Description

The RPM Program is a post-ADE 3*, post FOC program in sustainment that supports CBP's efforts to maintain scanning coverage at previously completed POEs and meet the *Security and Accountability For Every (SAFE) Port Act of 2006*. RPMs are used at U.S. land and sea POEs by CBP to scan cargo and conveyances in order to prevent the smuggling of R/N threats or threat materials into the United States, while facilitating the flow of legitimate trade and commerce. As POEs are reconfigured or expanded, RPMs must be relocated, decommissioned, and/or additional RPM systems must be deployed to maintain current scanning capabilities. In addition, improvements will be deployed to fielded systems to extend the service life of RPMs as well as augment detection efficacy, operational performance, and operational efficiency.

The Program plans to continue managing the deployment of the remaining polyvinyl toluene (PVT)-based systems in its inventory and to deploy selected improvements that have been projected to enhance operational or threat detection performance for fielded systems in FY 2018.

Justification

The *SAFE Port Act of 2006* codifies National Security Presidential Directive (NSPD)-43 as law, formalizing the legislative basis for DNDO. DNDO is responsible for coordinating the domestic portion of the GNDA to include R/N technical detection devices and systems development, testing, and acquisition. FY 2018 funding is required to ensure RPMs are relocated as necessary to support port reconfigurations and expansion and maintain scanning coverage; to ensure necessary improvements are made as the systems continue to age since initial installations began in 2003; and to begin installation of remote operations capability to reduce the manpower burden for CPB RPM operations and allow CBP to apply those resources elsewhere in the ports to perform other law enforcement missions, resulting in an overall risk reduction from weapons of mass destruction and other smuggling threats.

FY 2016 Key Milestone Events (Prior Year)

- Initiated 81 RPM installs and 75 decommissions.
- Completed 22 RPM installs and 26 RPM decommissions.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Initiate 162 RPM installs and 76 decommissions.
- Complete 93 RPM installs and 154 decommissions*.
- Begin operation of Trans Pacific conveyor-based RPM system at Port of Los Angeles/Long Beach.

- Conduct system optimization, testing and analysis of spectroscopic RPMs at the Port of Savannah, GA for future deployment.
- Conduct remote operations single lane and multi-lane pilots at the Port of Savannah, GA.

FY 2018 Planned Key Milestone Events (Budget year)

- Initiate 67 RPM installs and 4 decommissions.
- Begin initial operations of spectroscopic RPMs at the Port of Savannah, GA.
- Initiate deployment of remote operations equipment and software updates at selected POEs.

* Due to the number of variables affecting completion dates of RPM installs and decommissions, in FY18, DNDO will begin reporting RPM installs and decommissions initiated each fiscal year instead of those completed each FY.

Overall Investment Funding

	Prior Years	FY 2016	FY 2017	FY 2018
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$44,329	$42,187	$33,773
Research and Development		-	-	--
Project Funding	$743,622	$44,329	$42,187	$33,773
Obligations	$743,622	$44,329	$42,187	
Expenditures				

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value
HSHQDC-15-X-00060	Pacific Northwest National Lab	IAA	3/15	3/15	3/20	N/A	$46,287
HSHQDC-16-PA001	General Service Administration	RWA		6/16	9/18	N/A	$2,176
HSHQDC-15-00108	CBP Office of Technology Innovation and Acquisition (OTIA)	IAA		6/15	12/16	N/A	$773
To be assigned at the time of award	General Service Administration	RWA	7/17			N/A	$5,710

Significant Changes to Investment since Prior Year Enacted

None.

Investment Schedule

Description	Design Work		Project Work	
	Initiated	Completed	Initiated	Completed
FY 2016				
Initiated 81 RPM installs and 75 decommissions			1QTR/FY16	
Completed 22 RPM installs and 26 RPM decommissions				4QTR/FY16
FY 2017				
Initiate 162 RPM installs and 76 decommissions			1QTR/FY17	
Complete 93 RPM installs and 154 decommissions				4QTR/FY17
Achieve Trans Pacific system Go-Live				1QTR/FY17
Deploy spectroscopic RPMs at Port of Savannah, GA			1QTR/FY17	4QTR/FY17
Conduct remote operations multi-lane pilot at Savannah, GA			2QTR/FY17	4QTR/FY17
FY 2018				
Initiate 67 RPM installs and 4 decommissions			1QTR/FY18	
Begin initial operations of spectroscopic RPMs at the Port of Savannah, GA			1QTR/FY18	
Initiate deployment of remote operations equipment and software updates at selected POEs			1QTR/FY18	

Radiation Portal Monitor Replacement Program

Procurement, Construction, and Improvement Funding

Investment Description

RPMs are used at U.S. land and sea POEs by CBP to scan cargo and conveyances in order to prevent the smuggling of R/N threats or threat materials into the United States, while facilitating the flow of legitimate trade and commerce.

The RPM RP will support needed enhancements to CBP R/N materials detection and identification capabilities at high-volume POEs by addressing the five key drivers of enhancing mission effectiveness: (1) monitoring the state of health, (2) modernizing, (3) addressing emerging needs, (4) increasing reliability, availability, and (5) maintainability. These drivers were developed jointly by CBP and Pacific Northwest National Laboratory to guide DHS RPM recapitalization and modernization efforts.

The focus of the current RPM RP is the selective deployment of new RPMs to enhance mission effectiveness, gain operational efficiencies, and to address emerging mission needs. Currently, the program plans are to acquire and deploy approximately 200 RPMs between FY 2018 and FY 2022. The program plans to procure nine systems in FY 2018. The RPM RP source selection began in 2Q/FY 2017.

Justification

RPM RP is aligned to the GNDA in the following areas: (1) Deploy detection systems for scanning of cargo and conveyances for R/N materials at U.S. ports of entry; and (2) Ensure steady state operations of deployed radiation detection systems do not unduly disrupt commercial cargo and passenger flow.

FY 2018 funding is required to increase the inventory of RPMs to meet current and expected near-term demand. This funding will also allow the replacement of older units that cannot accommodate new revised operational settings that help mitigate nuisance alarms which is precluding the implementation of remote operations capability.

FY 2016 Key Milestone Events (Prior Year)

- Conducted characterization and environment test planning.
- Completed Acquisition Decision Event (ADE) 1B (R&D-funded).
- Completed planning for System Threat Review (STR) Phase I/II/III (R&D-funded).

FY 2017 Planned Key Milestone Events (Year of Execution)

- Receive ADE-2A and -2B approvals, and proceed into 2C.
- Host an Industry Day for potential bidders on the RPM RP procurement.

- Complete STR Phase I; finalized process and models for future STRs.
- Release the Final RFP to initiate the procurement.
- Complete an initial evaluation of proposals and conduct Downselect 1.
- Commence characterization and environmental test campaigns.

FY 2018 Planned Key Milestone Events (Budget year)

- Complete STR Phase 2.
- Conduct Downselect 2.
- Obtain ADE-2C approval to initiate Low Rate Initial Production (LRIP).
- Award up to 3 contracts for RPM integration and test articles.
- Commence Stream of Commerce and Integration Testing.

Overall Investment Funding

	Prior Years	FY 2016	FY 2017	FY 2018
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$4,000	$7,509	$26,751
Research and Development		$4,105	-	-
Project Funding	$1,917	$8,105	$7,509	$26,751
Obligations	$1,917	$8,105	$7,509	
Expenditures				

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value
HSHQDN-16-X-00049	Defense Threat Reduction Agency	IAA	8/16	8/16	8/16		$1,300
HSHQDC-15-X-00092	Los Alamos National Lab	IAA	7/16	7/16	6/17		$300

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value
HSHQDC-15-X-00096	Oak Ridge National Lab	IAA	8/15	8/15	6/18		$1,635
HSHQDC-15-X-00136	Sandia National Lab	IAA	8/15	8/15	8/18		$765
HSHQDC-13-C-00005	Johns Hopkins University Applied Physics Laboratory	CPFF	11/12	11/12	11/17		$685
HSHQDC-14-X-00076	Oak Ridge National Lab	IAA	2/14	2/14	6/17		$101
HSHQDN-16-X-00006	Idaho National Lab	IAA	4/16	4/16	4/19		$119
HSHQDC-15-X-00098	Savannah River National Lab	IAA	6/15	7/15	6/18		$250
HSHQDC-15-X-00098	Los Alamos National Lab	IAA	8/16	8/16	3/18		$300
HSHQDN-16-X-00007	Los Alamos National Lab	IAA	8/16	8/16	3/18		$700
To be determined at time of award	PMO Contractor Support/SETA SESP	Commercial Contracts	10/17	10/17	10/20		$3,241
To be determined at time of award	To be determined at time of award	IDIQ	6/18	6/18	6/19		$2,566
To be determined at time of award	To be determined at time of award	IDIQ	6/19	6/19	6/20		$48,415

Significant Changes to Investment since Prior Year Enacted

RPM RP was approved to enter into the DHS "Obtain" stage.

Investment Schedule

Description	Design Work		Project Work	
	Initiated	Completed	Initiated	Completed
	FY 2016			
Completed Acquisition Decision Event (ADE) 1B				1QTR/FY17
Completed planning for System Threat Review (STR) Phase I/II/III				4QTR/FY16
	FY 2017			
Received ADE-2A and -2B approvals			1QTR/FY17	3QTRFY17

Description	Design Work		Project Work	
	Initiated	Completed	Initiated	Completed
Hosted an Industry Day for potential bidders on the RPM RP procurement				1QTR/FY17
Completed STR Phase 1				2QTR/FY17
Released Final RFP				2QTR/FY17
Completed initial evaluation of proposals/conducted Downselect 1				3QTR/FY17
Commenced characterization and environmental test campaigns			3QTR/FY17	1QTR/FY18
	FY 2018			
Complete STR Phase 2				1QTR/FY18
Conduct Downselect 2				2QTR/FY18
Obtain ADE-2C approval to initiate Low Rate Initial Production (LRIP)				3QTR/FY18
Award up to 3 contracts for RPM integration and test articles				3QTR/FY18
Commence Stream of Commerce and Integration Testing			4QTR/FY18	

On-Dock Rail (ODR) Program

Procurement, Construction, and Investments Funding

Investment Description

The ODR Program is a pre-ADE 3 program intended to provide increased scanning and detecting efficiencies while screening for R/N material entering the United States at sea ports of entry via cargo containers.

Justification

ODR is aligned to the GNDA in the following areas: (1) Deploy detection systems for scanning of cargo and conveyances at U.S. ports of entry for R/N materials; and (2) Ensure steady state operations of deployed radiation detection systems do not unduly disrupt commercial cargo flow.

ODR solutions are appropriate when a terminal is experiencing stream of commerce limitations based on the operationally-inefficient and cost-ineffective use of mobile RPMs. The program is currently completing deployment of an upgraded prototype system, Straddle Carrier Portal (SCP), at Port of Tacoma (PoT) Pierce County Terminal (PCT). This ODR solution features two fixed R/N scanning systems that can accommodate straddle portal carriers with intermodal cargo containers. FY18 funding is required to complete the construction of a similar system at Maher Terminal in the Port of New York/New Jersey.

FY 2016 Key Milestone Events (Prior Year)

- Finalized ODR Threat Basis Memo.
- Began planning for SCP fabrication, site design and construction of PoT terminal.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Completed DNDO Governance Review Board, 2a/2b.
- Begin Construction at PoT.
- Conduct ODR Performance Testing (PT) Milestone MS-4 and MS-5.
- Begin SCP fabrication, site design and construction at Maher terminal, Port of NY/NJ.

FY 2018 Planned Key Milestone Events (Budget year)

- Complete deployment at PoT.
- Begin the Post-Implementation Review for SCP at PoT.
- Complete SCP fabrication, site design and construction at Maher Terminal.

Overall Investment Funding

	Prior Years	FY 2016	FY 2017	FY 2018
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$2,940	$3,400	$1,000
Research and Development		$5,414	$3,250	-
Project Funding	$31,796	$8,354	$6,650	$1,000
Obligations	$31,796	$8,354	$6,650	
Expenditures				

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value
HSHQDC-15-X-00131	Pacific Northwest National Lab	IAA		7/15	7/18		$725
HSHQDC-13-C-00005	JHU-Applied Physics Lab	IAA	11/12	11/12	11/17		$1,489
HSHQDC-11-X-00104	Savannah River National Lab	IAA		2/11	12/16		$800
HSHQDC-16-X-00063	Savannah River National Lab	IAA		3/16	9/21		$2,840
HSHQDC-15-X-00060	Pacific Northwest National Lab	IAA		3/15	3/20		$1,940
HSHQDC-15-X-00098	Savannah River National Lab	IAA		7/15	8/18		$1,150
HSHQDC-15-X-00098	Savannah River National Lab	IAA	7/15	7/15	8/18		$250
HSHQDC-13-C-00005	JHU-Applied Physics Lab	Existing IAA	11/12	11/12	11/17		$350
HSHQDN-16-X-00047	Pacific Northwest National Lab	Existing IAA	8/16	8/16	8/21		$750
HSHQDN-16-X-00047	Pacific Northwest National Lab	Existing IAA	8/16	8/16	8/21		$300
HSHQDC-16-X-00063	Savannah River National Lab	Existing IAA	3/16	3/16	9/21		$1,350

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value
To be determined at time of award	Sandia National Lab	New IAA	6/17	6/17	12/22		$400

Significant Changes to Investment since Prior Year Enacted

CBP established a requirement to implement an ODR radiation scanning system at Maher Terminal in the Port of New York/New Jersey.

Investment Schedule

Description	Design Work		Project Work	
	Initiated	Completed	Initiated	Completed
FY 2016				
Finalized ODR Threat Basis Memo				1QTR/FY17
FY 2017				
Completed DNDO Governance Review Board, 2a/2b				1QTR/FY17
Begin Construction at PoT			3QTR/FY17	
Conduct ODR Performance Testing (PT) Milestone (MS)-4 and MS-5			1QTR/FY17	1QTR/FY17
Begin SCP fabrication, site design and construction at Maher terminal, Port of NY/NJ			4QTR/FY17	
FY 2018				
Complete deployment at PoT				1QTR/FY18
Begin the Post-Implementation Review for SCP at PoT			3QTR/FY18	
Complete SCP fabrication, site design and construction at Maher terminal				4QTR/FY18

International Rail (IRAIL) Program

Procurement, Construction, and Improvements Funding

Investment Description

The IRAIL program is a pre-ADE 2A program identifying and detecting radiological and nuclear R/N material entering the United States via freight rail. IRAIL supports the CBP-led Integrated Rail Inspection System (IRIS) Program, by leading the RDE sub-system procurement as well as IRIS test and evaluation efforts. The CBP IRIS Program will re-capitalize the current fleet of aging Non-Intrusive Inspection (NII) x-ray imaging equipment employed at international rail crossings.

Justification

DHS has identified the requirement to improving the capability to scanning cargo at international rail crossings as a priority..

FY 2016 Key Milestone Events (Prior Year)

- No PCI funding.

FY 2017 Planned Key Milestone Events (Year of Execution)

- No PCI funding.
- Conduct market research with RFI release (R&D-funded).
- Support development of RFP and test plans (R&D-funded).

FY 2018 Planned Key Milestone Events (Budget year)

- Release RFP.
- Procure first unit for test and evaluation.

Overall Investment Funding

	Prior Years	FY 2016	FY 2017	FY 2018
Operations and Support		-	-	-
Procurement, Construction, and Improvements		-	-	$1,000
Research and Development		$1,646	$3,850	$3,357
Project Funding	$10,038	$1,646	$3,850	$4,357
Obligations	$10,038	$1,646	$3,850	
Expenditures				

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value
To be determined at the time of contract award	CBP	IAA	5/18	5/18	12/23		TBD

Significant Changes to Investment since Prior Year Enacted

CBP established a requirement to pursue an integrated NII/RDE capability for IRAIL.

Investment Schedule

Description	Design Work		Project Work	
	Initiated	Completed	Initiated	Completed
	FY 2017			
Conduct market research with RFI release			2QTR/FY17	3QTR/FY17
Support development of RFP and test plans			3QTR/FY17	4QTR/FY17
	FY 2018			
Release RFP				1QTR/FY18
Procure first unit(s) for test and evaluation				4QTR/FY18

Human Portable Rad/Nuc Systems – Investment

Capital Investments Exhibits

Procurement/Acquisition Programs

Investment	Unique Item Identifier	Acquisition Level	Procurement / Construction	IT/Non-IT	MAOL	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget
Human Portable Rad/Nuc Systems	-	3	Procurement	Non-IT	No	$37,020	$34,000	$24,572

The Human Portable Rad/Nuc Detection Systems PPA includes resources to acquire and deploy human portable RDE that can be carried, worn, or easily moved by a user to support DHS operational end-users and address GNDA requirements. These devices play a critical role in the layered defenses of the United States against radiological or nuclear terrorist attacks. The portfolio consists of personal radiation detectors (PRD), handheld radioisotope identification devices (RIID), human portable tripwire (HPT), linear radiation monitors (LRM), radiation detection backpacks, and handheld radiation monitors (HRM). These systems are used to detect, localize, and/or identify radiological material. Most are relatively lightweight, easy to use, and of sufficiently low cost for widespread deployment. The following table provides a summary of the programs included in this PPA.

Investment	Unique Item Identifier	Acquisition Level	Procurement / Construction	IT / Non IT	MAOL	FY 2016 Revised Enacted*	FY2017 Annualized CR	FY 2018 President's Budget
Human Portable Radiation Detection Systems Portfolio						**$37,020**	**$34,000**	**$24,572**
Basic Handheld RIIDs	024-000005960	Level 3	Procurement	Non-IT	Yes	$1,845	$7,001	$8,877
Advanced Handheld RIIDs	N/A	Level 3	Procurement	Non-IT	No	$1,815	$5,244	-
PRD	024-000005959	Level 3	Procurement	Non-IT	Yes	$7,263	$7,363	$7,404
HPT	024-000005958	Level 3	Procurement	Non-IT	Yes	$19,933	$10,521	$3,685
Backpack Systems	N/A	Level 3	Procurement	Non-IT	No	$4,540	$3,871	$4,606
Other**	N/A	N/A	Procurement	Non-IT	No	$1,624	-	-

*In FY 2016, the PPAs for the Radiation Portal Monitor (RPM) Program and HPRDS Program were combined into a single PPA for RDE equipment; funding was allocated to the PPA level only.
** Other includes equipment such as Linear Radiation Monitors (LRM), Handheld Radiation Monitors (HRM), Source Kits, etc.

HPRDS Equipment	FY 2018 Planned Procurement Units
Basic Handheld RIIDs	241
Advanced Handheld Germanium RIIDs	0
PRDs	4,641
HPTs	363
Backpacks	101

HPRDS Equipment	FY 2018 Planned Procurement Units
USCG	
Basic Handheld RIIDs	222
HPTs	103
PRDs	321
CBP	
Basic Handheld RIIDs	15
PRDs	4,200
HPTs	117
TSA (VIPR Teams)	
Backpacks	46
MDDP and Other	
Basic Handheld RIIDs	4
Backpacks	55
PRDs	120
HPTs	143

Basic Handheld (BHH) RIID

Procurement, Construction, and Improvements Funding

Investment Description

Basic Handheld (BHH) RIIDs are used for search, detection, localization, and identification of radionuclide composition of R/N materials, and for quick and accurate measurement of dose rate and count rate. These devices are also used to support secondary screening and small-area searches.

Justification

Many legacy handhelds used by CBP, USCG, and TSA have reached or exceeded their expected service life and need immediate replacement. In FY 2016, DNDO began recapitalizing fielded BHH RIIDs using a strategic sourcing contract with an economic order quantity construct. This contract provided Department-wide cost savings by replacing older, less capable equipment with modernized replacement BHH RIIDs with greater capability and lower sustainment costs. In FY 2018, DNDO will continue recapitalizing legacy systems to maintain current capability. FY 2018 PCI funding is required to acquire and deploy BHH RIIDs to support Component FOC requirements. By meeting FOC requirements for USCG and continuing deliveries for CPB, DHS will be able to close and adequately mitigate capability gaps, minimizing the risk of illicit R/N material entering the United States.

FY 2016 Key Milestone Events (Prior Year)

- Completed Operational Assessment for CBP.
- Began to deliver units to DHS components.
- Completed Operational Assessment for USCG.
- Procured upgrade kits for selected legacy systems.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Begin to recapitalize Mobile Detection Deployment Program (MDDP) fleet by beginning device deliveries.
- Begin to recapitalize USCG fleet by beginning device deliveries. .
- Continue device deliveries to CBP.

FY 2018 Planned Key Milestone Events (Budget year)

- Continue device deliveries for CBP and USCG.

Overall Investment Funding

	Prior Years	FY 2016	FY 2017	FY 2018
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$1,845	$7,001	$8,877
Research and Development		-	-	-
Project Funding	$196,452	$1,845	$7,001	$8,877
Obligations	$196,452	$1,845	$7,001	
Expenditures				

*Prior to FY17, all HPRDS were tracked as a consolidated portfolio and not as separate projects. The Prior Years "Project Funding" and "Obligations" reflect the respective values for the total portfolio and not the individual project.

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value
HSHQDC-15-D-00018	Smiths Detection	IDIQ	9/15	9/15	9/20		$143,000

Significant Changes to Investment since Prior Year Enacted

None

Investment Schedule

Description	Design Work		Project Work	
	Initiated	Completed	Initiated	Completed
FY 2016				
Operational Assessment for CBP			3QTR/FY16	3QTR/FY16
Deliver units to DHS components			1QTR/FY16	4QTR/FY16
Operational Assessment for USCG			3QTR/FY16	3QTR/FY16
Upgrade kits for legacy systems			4QTR/FY16	4QTR /FY17
FY 2017				
Deliveries for MDDP			4QTR/FY17	4QTR /FY18
Deliveries for USCG			4QTR/FY17	4QTR /FY18
Continue deliveries to CBP			1QTR/FY17	4QTR/FY18
FY 2018				
Continue deliveries for CBP and USCG			1QTR/FY18	4QTR/FY18

Advanced Handheld (AHH) RIID

Procurement, Construction, and Improvements Funding

Investment Description

AHH RIIDs are often used as the final arbiter when illicit trafficking is suspected due to their superior capability for R/N detection and identification. They are also used in laboratory settings as reference detectors.

Justification

AHH RIIDs are acquired in small quantities due to their expense and method of employment. DHS Component User requirements for this equipment are dynamic; however, at this time, there is no requirement for FY 2018 funds.

FY 2016 Key Milestone Events (Prior Year)

- Delivered devices for DNDO MDDP.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Continue delivery of devices to CBP and USCG.

FY 2018 Planned Key Milestone Events (Budget year)

- Complete delivery of devices.
- Reach FOC for all components.

Overall Investment Funding

	Prior Years	FY 2016	FY 2017	FY 2018
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$1,815	$5,244	-
Research and Development		-	-	-
Project Funding	$196,452	$1,185	$5,244	-
Obligations	$196,452	$1,185	$5,244	
Expenditures				

*Prior to FY17, all HPRDS were tracked as a consolidated portfolio and not as separate projects. The Prior Years "Project Funding" and "Obligations" reflect the respective values for the total portfolio and not the individual project.

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value
HSHQDC-12-D-00080	AMETEK	IDIQ	9/12	9/12	9/17		$8,800

Investment Schedule

Description	Design Work		Project Work	
	Initiated	Completed	Initiated	Completed
	FY 2016			
Delivered AHH devices for DNDO MDDP				4QTR/FY16
	FY 2017			
Initiate delivery of AHH devices to CBP and USCG			2QTR/FY17	
	FY 2018			
Complete Delivery of AHH devices				4QTR/FY18
Reach FOC for all Components				4QTR/FY18

Personal Radiation Detector (PRD)

Procurement, Construction, and Improvements Funding

Investment Description

PRDs are pager-size devices used to detect R/N materials. The PRDs are typically clipped to a uniform or belt. PRDs detect both gamma (general purpose) and gamma/neutron (maritime environment) R/N sources. They automatically monitor the environment and alert the user if R/N material is detected.

Justification

PRDs are continuously worn by operators for R/N detection and personal protection. Today, legacy systems by CBP, USCG, and TSA, have reached or exceeded their expected service life and are in need of immediate replacement. In FY 2018, DNDO will award a strategic sourcing contract to recapitalize legacy systems to maintain current capability. This strategic sourcing effort provides a means to provide PRDs to all users and enable Department-wide cost savings by replacing older, less capable equipment with an economic order quantity construct. FY 2018 PCI funding is required to begin deploying PRDs to support Component requirements for detection of illicit R/N materials and for the continuing safety of operators.

FY 2016 Key Milestone Events (Prior Year)

- Continued procurement of legacy PRDs for CBP, USCG, and MDDP.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Release PRD Strategic Sourcing RFP.
- Conduct PRD Strategic Sourcing test and evaluation.

FY 2018 Planned Key Milestone Events (Budget year)

- Award strategic sourcing contract(s) to vendor(s).
- Begin delivering strategically sourced devices to CBP and USCG.

Overall Investment Funding

	Prior Years	FY 2016	FY 2017	FY 2018
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$7,263	$7,363	$7,404
Research and Development		-	-	-
Project Funding	$196,452	$7,263	$7,363	$7,404
Obligations	$196,452	$7,263	$7,363	
Expenditures				

*Prior to FY17, all HPRDS were tracked as a consolidated portfolio and not as separate projects. The Prior Years "Project Funding" and "Obligations" reflect the respective values for the total portfolio and not the individual project.

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value
HSHQDC-13-A-00027	Laurus Systems, Inc	BPA	5/13	5/13	5/18		$1,000
HSHQDC-10-A-00097	Sensor Technology Engineering	BPA	4/11	4/11	4/16		$14,000
HSHQDC-13-A-00043	William F Hawk	BPA	9/13	9/13	9/18		$9,900
HSHQDN-16-F-00007	Sensor Technology Engineering	GSA Schedule	9/16	9/16	3/18		$3,943
To be assigned at time of award	To be determined at time of award	IDIQ	10/17	10/17	10/22		$90,000

Significant Changes to Investment since Prior Year Enacted

The PRD program was approved to enter into the DHS "Obtain" stage to begin recapitalizing fielded PRDs.

Investment Schedule

Description	Design Work		Project Work	
	Initiated	Completed	Initiated	Completed
	FY 2016			
Procure legacy PRDs			2QTR/FY16	1QTR/FY18
	FY 2017			
Release RFP				2QTR/FY17
Conduct test & evaluation			3QTR/FY17	4QTR/FY17
	FY 2018			
Award strategic sourcing contract(s)				TBD/FY18
Deliver PRDs to CBP and USCG			2QTR/FY18	

Human Portable Tripwire (HPT)

Procurement, Construction, and Investments Funding

Investment Description

HPT devices are small/wearable systems that provide next-generation capabilities to detect, identify, communicate, and adjudicate R/N threats. HPTs also function as personal protective equipment to warn operators of potential exposure to harmful levels of radiation. HPTs are able to identify and locate the source of radiation and allow personnel to take appropriate action. The technology includes communication features that allow the user to easily seek additional technical assistance from experts if needed.

Justification

These spectroscopic personal radiation devices are a critical tool for personnel who operate in the maritime environment, at land and sea ports of entry, and within the United States. FY 2018 PCI funding is required to continue to deploy HPTs to support Component FOC requirements to meet their R/N mission requirements. In doing so, DHS will mitigate capability gaps, decreasing the risk of illicit R/N material entering the United States.

FY 2016 Key Milestone Events (Prior Year)

- Deployed Initial Operational Capability (IOC) quantities to TSA, CBP, USBP, USCG, and DNDO MDDU.
- Achieved FOC quantities to TSA.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Continue deliveries of HPT devices.
- Conduct Post-Implementation Review for CBP.

FY 2018 Planned Key Milestone Events (Budget year)

- Continue deliveries of HPT devices.
- Conduct Post-Implementation Review for USBP.

Overall Investment Funding

	Prior Years	FY 2016	FY 2017	FY 2018
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$19,933	$10,521	$3,685
Research and Development		-	-	-
Project Funding	$196,452	$19,933	$10,521	$3,685
Obligations	$196,452	$19,933	$10,521	
Expenditures				

*Prior to FY17, all HPRDS were tracked as a consolidated portfolio and not as separate projects. The Prior Years "Project Funding" and "Obligations" reflect the respective values for the total portfolio and not the individual project.

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value
HSHQDC-15-D-00019	FLIR Detection	IDIQ	9/15	9/15	9/20		$24,000

Investment Schedule

Description	Design Work		Project Work	
	Initiated	Completed	Initiated	Completed
FY 2016				
IOC for Component Users				4QTR/FY16
FOC for TSA				4QTR/FY16
HPT device deliveries for USBP and USCG			3QTR/FY16	
FY 2017				
HPT device deliveries for USBP and USCG			3Q/FY16	
Post-Implementation Review for TSA			4Q/FY17	4Q/FY17
FY 2018				
HPT device deliveries for USBP and USCG				4QTR/FY18
Post-Implementation Review for USBP			1QTR/FY18	1QTR/FY18

Backpack Program
Procurement, Construction, and Improvements Funding

Investment Description
Backpack radiation detection systems are used when a wide-area detection capability is necessary, potentially in covert operations, and are used to quickly detect and locate a radiation threat in public or maritime environments such as aircraft, medium- to large-sized vessels, open-air events, parking lots, and stadiums. Backpack systems provide the capability to detect both gamma and neutron radiation. A backpack system is also being used for Small Vessel Standoff Detection (SVSD) Increment 1 requirements for boat-to-boat scanning capability. Current backpack systems use Helium-3 (^{3}He) for neutron radiation detection.

Justification
The program will procure wearable R/N detector systems with expansion capability to perform identification that will include ^{3}He-alternative technology.

FY 2016 Key Milestone Events (Prior Year)
- Procure ^{3}He backpack devices for USCG.

FY 2017 Planned Key Milestone Events (Year of Execution)
- Procure ^{3}He backpack devices for MDDP.

FY 2018 Planned Key Milestone Events (Budget year)
- Procure ^{3}He-alternative, wearable R/N detectors for TSA & MDDP.

Overall Investment Funding

	Prior Years	FY 2016	FY 2017	FY 2018
Operations and Support		-	-	-
Procurement, Construction, and Improvements		$4,540	$3,871	$4,606
Research and Development		-	-	-
Project Funding	$196,452	$4,540	$3,871	$4,606
Obligations	$196,452	$4,540	$3,871	
Expenditures				

*Prior to FY17, all HPRDS were tracked as a consolidated portfolio and not as separate projects. The Prior Years "Project Funding" and "Obligations" reflect the respective values for the total portfolio and not the individual project.

Contract Information (Current/Execution Year, Budget Year)

Contract Number	Contractor	Type	Award Date (mo/yr)	Start Date (mo/yr)	End Date (mo/yr)	EVM in Contract	Total Value
HSHQDC-14-D-00007	Sensor Technology Engineering	IDIQ	9/11	9/11	9/16		$7,300

Investment Schedule

Description	Design Work		Project Work	
	Initiated	Completed	Initiated	Completed
	FY 2016			
Procure legacy backpacks for USCG				3Q/FY16
	FY 2017			
Procure legacy backpacks for MDDP			1Q/FY17	3Q/FY17
	FY 2018			
Procure ^{3}He-alternative, wearable R/N detectors for TSA and MDDP				4Q/FY18

Department of Homeland Security

Domestic Nuclear Detection Office

Research and Development

Fiscal Year 2018
Congressional Justification

Table of Contents

Research and Development

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Architecture Planning and Analysis	-	-	$15,758	-	-	$15,578	-	-	$15,937	-	-	$359
Transformational Research and Development	-	-	$64,684	-	-	$63,943	-	-	$60,581	-	-	($3,362)
Detection Capability Development	-	-	$21,029	-	-	$20,788	-	-	$15,155	-	-	($5,633)
Detection Capability Assessments	-	-	$39,503	-	-	$39,051	-	-	$34,127	-	-	($4,924)
Nuclear Forensics	-	-	$19,031	-	-	$18,813	-	-	$18,361	-	-	($452)
Total	**-**	**-**	**$160,005**	**-**	**-**	**$158,173**	**-**	**-**	**$144,161**	**-**	**-**	**($14,012)**
Subtotal Discretionary - Appropriation	-	-	$160,005	-	-	$158,173	-	-	$144,161	-	-	($14,012)

*FY2016 Funding is shown in notional Common Appropriation Structure for comparison purposes

Overview

The Domestic Nuclear Detection Office (DNDO) leads the U.S. Government (USG) in development of the Global Nuclear Detection Architecture (GNDA) and its implementation, as well as coordination and stewardship of USG technical nuclear forensics efforts. DNDO's Research and Development (R&D) appropriation funds fundamental knowledge discovery, basic and applied research, technology and systems development leading to product acquisition, test and evaluation, and associated costs in support of the following Programs, Projects, or Activities (PPAs):

- **ARCHITECTURE, PLANNING, AND ANALYSIS PPA**

The Architecture, Planning, and Analysis PPA coordinates the development of an enhanced GNDA and implementation of its domestic portion. Its objective is to improve the capability to understand, anticipate, and mitigate the risk of nuclear terrorism. These efforts enable the Department of Homeland Security (DHS) to determine and address gaps and vulnerabilities in existing radiological/nuclear (R/N) detection capabilities. This is accomplished through a continuous process of stakeholder engagement involving the operational Components of the Department; other Federal agencies; and state, local, tribal, and territorial (SLTT) partners to formulate and adjust program plans and investment options, on an annual basis, that addresses the threat of nuclear terrorism across the Nation's homeland security enterprise.

- **TRANSFORMATIONAL RESEARCH AND DEVELOPMENT PPA**

The Transformational R&D PPA seeks to identify, explore, develop, and demonstrate science and technologies that address gaps in the GNDA; improve the performance of R/N detection and nuclear forensics capabilities; and/or significantly reduce the operational burden of radiation detection systems. DNDO 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 PPA have achieved technology readiness levels (TRL) one through seven.

- **DETECTION CAPABILITY DEVELOPMENT PPA**

The Detection Capability Development PPA incorporates the user requirements of DHS's operational Components into R/N detection systems. It achieves this by coordinating its systems engineering lifecycle activities with the end-user community and managing the task execution of DNDO's Solution Development Process (SDP).

Recognizing that innovation can originate in a variety of sectors, DNDO has adopted a "commercial first" approach that gives preference for solutions available in the private sector marketplace. Using this approach, DNDO leverages 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 PPA**

DNDO's research, development, and acquisition process is anchored by rigorous assessments of mission-related technologies as they are developed and deployed. Through the Detection Capability Assessments PPA, 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. DNDO 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. While T&E campaigns evaluate systems under development, 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 and SLTT (FSLTT) R/N detection and interdiction operations. These presentations can either be covert or overt in nature. The Program Assessments project performs objective reviews of the effectiveness of GNDA programs and their associated activities by examining

GNDA programs, CONOPS, protocols, policies, procedures, and training.

- **NUCLEAR FORENSICS PPA**

The Nuclear Forensics PPA advances the science of nuclear forensics - the examination of materials recovered from R/N 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 R/N trafficking networks; promote nuclear security; and deter potential adversaries by increasing their perceived and actual risk of failure and the prospect of being held accountable for planned or attempted attacks. This PPA includes the National Technical Nuclear Forensics Center (NTNFC), which through its operational readiness, technology advancement, and expertise development missions, provides centralized planning, integration and advancement of USG nuclear forensics capabilities while leading the interagency implementation of 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.

Research and Development
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$160,005		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$160,005**	**$158,173**	**$144,161**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$27,394	$21,629	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$187,399**	**$179,802**	**$144,161**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$187,399**	**$179,802**	**$144,161**
Obligations (Actual/Projections/Estimates)	$160,683	$179,802	$144,161
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Research and Development
Summary of Budget Changes
Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$160,005**
FY 2016 Revised Enacted	**-**	**-**	**$160,005**
FY 2017 Annualized CR	**-**	**-**	**$158,173**
FY 2018 Base Budget	**-**	**-**	**$158,173**
Transfer from FA FSLTTS due to Common Appropriation Structure Realignment	-	-	$1,118
Transfer to O&S Mission Support due to CAS Realignment	-	-	($3,474)
Total Transfers	**-**	**-**	**($2,356)**
Total Adjustments-to-Base	**-**	**-**	**($2,356)**
FY 2018 Current Services	**-**	**-**	**$155,817**
Architecture Planning and Analysis	-	-	($759)
Detection Capability Assessments	-	-	($1,450)
Detection Capability Development	-	-	($5,633)
Nuclear Forensics	-	-	($452)
Transformational Research and Development	-	-	($3,362)
Total, Program Decreases	**-**	**-**	**($11,656)**
FY 2018 Request	**-**	**-**	**$144,161**
FY 2017 TO FY 2018 Change	**-**	**-**	**($14,012)**

DNDO continues to examine and mature its implementation of the Common Appropriation Structure. As part of a review of program alignment, adversary analysis and capability integration activities and funding from the Federal, State, Local, Territorial, and Tribal Support PPA in Federal Assistance were identified as being more effectively integrated into the Architecture Planning and Analysis PPA in Research and Development. This $1.118 million transfer would consolidate adversary analysis and capability-based planning functions with architecture, risk, and other similar functions already in the Architecture Planning and Analysis PPA. This will result in more holistic analysis products that better advance DNDO's ability to understand, anticipate, and reduce the threat of radiological and nuclear terrorism.

Also identified as part of the review of program alignment, funds for information technology governance, infrastructure and cybersecurity were transferred from the Detection Capability Assessment PPA in Research and Development to the Mission Support PPA in Operations and Support. Some information technology infrastructure capabilities have matured beyond development and DNDO considers these activities best aligned to Operations and Support. The funding transferred supports preparation of agreements to effectively share radiological/nuclear (R/N) detection information among FSLTT partners, in order to prevent terrorism and enhance national security; and validates cybersecurity compliance and readiness of DNDO systems and safeguarding of DNDO sensitive information in third-party systems and services. The funding supports the evolution of technical competencies and expertise as well as tools and technologies which comprise DNDO's adaptive mission-support information technology infrastructure.

Research and Development
Justification of Program Changes

Dollars in Thousands

Program Changes	FY 2018 President's Budget		
	Positions	FTE	Amount
Program Change 1 - Architecture Planning and Analysis	**-**	**-**	**($759)**
Architecture Planning and Analysis	-	-	($759)
Program Change 2 - Detection Capability Assessments	**-**	**-**	**($1,450)**
Detection Capability Assessments	-	-	($1,450)
Program Change 3 - Detection Capability Development	**-**	**-**	**($5,633)**
Detection Capability Development	-	-	($5,633)
Program Change 4 - Nuclear Forensics	**-**	**-**	**($452)**
Nuclear Forensics	-	-	($452)
Program Change 5 - Transformational Research and Development	**-**	**-**	**($3,362)**
Transformational Research and Development	-	-	($3,362)
Total Program Changes	**-**	**-**	**($11,656)**

Program Change 1

Architecture Planning and Analysis

Description

The DNDO Architecture, Planning, and Analysis Program coordinates the development of an enhanced Global Nuclear Detection Architecture (GNDA) and implementation of its domestic portion. These efforts enable DHS to determine and address gaps and vulnerabilities in existing radiological/nuclear (R/N) detection capabilities. This is accomplished through a continuous process of stakeholder engagement with other Federal agencies; operational components of the department; and state, local, tribal, and territorial partners to formulate and adjust plans and investment options, on a regular basis, that address the threat of nuclear terrorism across the nation's homeland security enterprise.

Architecture, Planning, and Analysis projects advance the capability to understand, anticipate, and reduce the threat of nuclear terrorism. Each project contributes to the development of strategies and plans for implementing the GNDA and preventing R/N terrorism.

Justification

The reduction in funding will result in reductions to capability and delayed development activity in the Architecture, Planning, and Analysis Program.

Performance

DNDO's capability to address gaps and vulnerabilities in existing R/N detection capabilities will be reduced. The impact to the GNDA Analysis Sub-Project includes a reduction to Threat Elicitations and the Radiological/Nuclear Risk Analysis Model (RNRAM). The reduction in this account will allow DNDO to better focus its efforts towards Administration and DHS priorities. The impact to the GNDA Solutions Management Sub-Project affects Aviation Solutions Management. DNDO has been leading efforts to analyze international general aviation and air cargo operations and identify potential risk reduction enhancements. The products and tools developed through these efforts will be transferred to interagency partners with appropriate operational authorities and responsibilities to continue pursuit of these initiatives. DNDO will continue to participate in interagency working group efforts.

Program Change 2

Detection Capability Assessments: Operational Readiness Assessment

Description

The Operational Readiness Assessment Program is DNDO's primary means to objectively assess the operational effectiveness and performance of DNDO programs and deployed R/N detection capabilities at the FSLTT levels in support of the GNDA. The decrease will come from the Program Assessments project, which performs objective reviews of the effectiveness of GNDA programs and their associated activities.

Justification

The $1.4 million would have augmented existing in-house capabilities to support the assessment mission of evaluating GNDA programs, systems and operations. However, an internal review showed the project could sustain its current level of effort and meet requirements.

Performance

DNDO will continue to assess, at their present state, current and future GNDA programs and their ability to enhance R/N detection and improve the overall GNDA.

Program Change 3

Detection Capability Development: On Dock Rail and Aerial Detection

Description

The Detection Capability Development Program incorporates the user requirements of DHS's operational components into R/N detection systems. Ports with "on-dock rail," in which maritime cargo containers are transferred from ships to railways, have required R/N scanning solutions that are different from the standard practice of scanning truck-borne containers as they depart from seaports. Aerial Detection is a planned program to identify, acquire and deploy a detection capability via an aircraft-borne system to intercept illicit radiological threats at much greater distances from major population centers and critical infrastructure with fast response times.

Justification

Funding for On Dock Rail (ODR) in FY 2018 would have been used for System Threat Review for capabilities at Maher Terminal in New Jersey, and Analysis of Alternatives and Capabilities Based Assessment for additional ports that may seek an on-dock rail solution. The reduced funding will delay installation of on-dock rail capability at any additional ports.

In FY 2018, there is no funding allocated to Aerial Detection pending the completion of operational requirements. This reduction in funding will delay the development and technology transition of the Aerial Detection program.

Performance

This program change will not impact the current R/N detection scanning rates at seaports for containerized cargo from FY 2018 – 2022. The elimination of FY 2018 funding allocated to the Aerial Detection Program will delay the start of the program until at least FY 2019.

Program Change 4

Nuclear Forensics: Technology Advancement and Operational Readiness

Description

The Nuclear Forensics Technology Advancement program addresses the pre-detonation materials forensics capability development mission. This program improves our national ability to analyze, characterize, and ultimately trace nuclear materials back to their

source. The Nuclear Forensics Operational Readiness Program 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.

Justification

To better focus efforts towards Administration and DHS priorities, DNDO will defer development of a new methodology, Resonance Ionization Mass Spectrometry, which is designed to improve the speed of nuclear forensics material characterizations. In addition, the characterization of nuclear materials in the U.S. inventory will be reduced.

DNDO will also reduce interagency coordination and support of nuclear forensics exercises by decreasing the number of subject matter experts from laboratories and DNDO who support planning, analysis, and evaluation of interagency exercises.

Performance

The reduction to Technology Advancement and Operational Readiness will limit the number of operational laboratories involved in the continual evaluation and analysis of special nuclear materials to enable DNDO to focus efforts towards Administration and DHS priorities. DNDO relies on a comprehensive complex of laboratories to perform analyses so they are continually exercised, certified, and validated for the Nuclear Forensics mission. This reduction will have a ripple effect on the U.S. government's operational readiness by reducing the responsiveness should there be a need. Additionally, the reduction takes away opportunities to develop the necessary personnel expertise, from undergraduate to post-doctorate levels, at the affected labs.

Program Change 5

Transformational Research and Development: Advanced Technology Demonstration

Description

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

To better focus efforts towards Administration and DHS priorities, DNDO will focus efforts on basic and applied research as well as longer standing technology development projects.

Performance

The HIRS project planned to investigate both hardware and software (i.e., automated threat recognition algorithms) approaches to enhance the ability of non-intrusive inspection (NII) systems to detect nuclear threats in rail cargo. This funding reduction will require the HIRS project to focus solely on software approaches. This will limit the overall potential capability of future systems, but the HIRS project will still be able to provide an improvement in capability of commercially available systems within the planned timeline.

Research and Development
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Architecture Planning and Analysis	$15,758	$15,578	$15,937	$359
Transformational Research and Development	$64,684	$63,943	$60,581	($3,362)
Detection Capability Development	$21,029	$20,788	$15,155	($5,633)
Detection Capability Assessments	$39,503	$39,051	$34,127	($4,924)
Nuclear Forensics	$19,031	$18,813	$18,361	($452)
Total	**$160,005**	**$158,173**	**$144,161**	**($14,012)**
Discretionary - Appropriation	$160,005	$158,173	$144,161	($14,012)

Research and Development
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$664	$771	$1,003	$232
25.1 Advisory and Assistance Services	$34,501	$32,859	$38,192	$5,333
25.2 Other Services from Non-Federal Sources	$557	$796	$116	($680)
25.3 Other Goods and Services from Federal Sources	$52,551	$53,673	$44,265	($9,408)
25.5 Research and Development Contracts	$56,433	$58,924	$48,389	($10,535)
26.0 Supplies and Materials	-	-	$10	$10
31.0 Equipment	$33	$27	$46	$19
41.0 Grants, Subsidies, and Contributions	$15,266	$11,123	$12,140	$1,017
Total - Non Pay Object Classes	**$160,005**	**$158,173**	**$144,161**	**($14,012)**

Architecture Planning and Analysis – PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Architecture Planning and Analysis	-	-	$15,758	-	-	$15,578	-	-	$15,937	-	-	$359
Total	**-**	**-**	**$15,758**	**-**	**-**	**$15,578**	**-**	**-**	**$15,937**	**-**	**-**	**$359**
Subtotal Discretionary - Appropriation	-	-	$15,758	-	-	$15,578	-	-	$15,937	-	-	$359

Architecture Planning and Analysis PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$15,758		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$15,758**	**$15,578**	**$15,937**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$1,119	$2,142	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$16,877**	**$17,720**	**$15,937**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$16,877**	**$17,720**	**$15,937**
Obligations (Actual/Projections/Estimates)	$14,906	$17,720	$15,937
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Architecture Planning and Analysis – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$15,758**
FY 2016 Revised Enacted	**-**	**-**	**$15,758**
FY 2017 Annualized CR	**-**	**-**	**$15,578**
FY 2018 Base Budget	**-**	**-**	**$15,578**
Transfer from FA FSLTTS due to Common Appropriation Structure Realignment	-	-	$1,118
Total Transfers	**-**	**-**	**$1,118**
Total Adjustments-to-Base	**-**	**-**	**$1,118**
FY 2018 Current Services	**-**	**-**	**$16,696**
Architecture Planning and Analysis	-	-	($759)
Total, Program Decreases	**-**	**-**	**($759)**
FY 2018 Request	**-**	**-**	**$15,937**
FY 2017 TO FY 2018 Change	**-**	**-**	**$359**

PPA Description

The Architecture, Planning, and Analysis PPA coordinates the development of an enhanced GNDA and implementation of its domestic portion. Its objective is to improve the capability to understand, anticipate, and mitigate the risk of nuclear terrorism. These efforts enable the Department of Homeland Security (DHS) to determine and address gaps and vulnerabilities in existing R/N detection capabilities. This is accomplished through a continuous process of stakeholder engagement involving the operational Components of the Department; other Federal agencies; and state, local, tribal, and territorial (SLTT) partners to formulate and adjust program plans and investment options, on an annual basis, that addresses the threat of nuclear terrorism across the Nation's homeland security enterprise.

Adjustments to Base Justification

DNDO continues to examine and mature its implementation of the Common Appropriation Structure. As part of a review of program alignment, adversary analysis and capability integration activities and funding from the Federal, State, Local, Territorial, and Tribal Support PPA in Federal Assistance were identified as being more effectively integrated into the Architecture Planning and Analysis

PPA in Research and Development. This $1.118 million transfer would consolidate adversary analysis and capability-based planning functions with architecture, risk, and other similar functions already in the Architecture Planning and Analysis PPA. This will result in more holistic analysis products that better advance DNDO's ability to understand, anticipate, and reduce the threat of radiological and nuclear terrorism.

Architecture Planning and Analysis – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Architecture Planning and Analysis	$15,758	$15,578	$15,937	$359
Total	**$15,758**	**$15,578**	**$15,937**	**$359**
Discretionary - Appropriation	$15,758	$15,578	$15,937	$359

Architecture Planning and Analysis – PPA
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$327	$340	$340	-
25.1 Advisory and Assistance Services	$10,861	$10,798	$11,956	$1,158
25.2 Other Services from Non-Federal Sources	$557	$579	$116	($463)
25.3 Other Goods and Services from Federal Sources	$3,980	$3,834	$3,469	($365)
26.0 Supplies and Materials	-	-	$10	$10
31.0 Equipment	$33	$27	$46	$19
Total - Non Pay Object Classes	**$15,758**	**$15,578**	**$15,937**	**$359**

Architecture Planning and Analysis – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
GNDA Analysis	$5,799	$7,272	$8,479	$1,207
GNDA Solutions Management Program	$5,502	$3,666	$2,924	($742)
GNDA Planning and Reporting	$1,765	$2,433	$2,318	($115)
International Program	$2,692	$2,207	$2,216	$9
Total – Non Pay Cost Drivers	**$15,758**	**$15,578**	**$15,937**	**$359**

NARRATIVE EXPLANATION OF CHANGES

DNDO balanced program requirements while supporting the FY 2018 President's Budget. The changes in the previous table reflect the $1.118 million transfer from the Federal, State, Local, Territorial, and Tribal Support PPA and the $0.759 million program reduction in the Architecture Planning and Analysis PPA. The funding transfer is made to align with DNDO's mission to prevent nuclear terrorism by continuously improving capabilities to deter, detect, respond to, and attribute attacks, in coordination with domestic and international partners. The transfer consolidates adversary analysis and capability-based planning functions with architecture, risk, and other similar functions already in the Architecture Planning and Analysis PPA. This will result in more holistic analysis products that better advance DNDO's ability to understand, anticipate, and reduce the threat of radiological and nuclear terrorism. The remaining adjustments align program funding with objectives for FY 2018 and reflect prioritization between program areas.

Architecture Planning and Analysis – PPA
Research and Development
Technology Readiness Level Exhibit

Project Description:
The DNDO Architecture, Planning, and Analysis Program coordinates the development of an enhanced GNDA and implementation of its domestic portion. These efforts enable DHS to determine and address gaps and vulnerabilities in existing R/N detection capabilities. This is accomplished through a continuous process of stakeholder engagement with other Federal agencies; operational Components of the Department; and SLTT partners to formulate and adjust plans and investment options, on a regular basis, that address the threat of nuclear terrorism across the Nation's homeland security enterprise.

Architecture, Planning, and Analysis projects advance the capability to understand, anticipate, and reduce the threat of nuclear terrorism. Each of the following contributes to the development of strategies and plans for implementing the GNDA and preventing R/N terrorism.

Sub-Projects

- **Planning and Reporting:** The GNDA Planning and Reporting Project coordinates engagement with DNDO's DHS and interagency partners for strategic and implementation planning of the GNDA, summarizing the accomplishments through reporting, and promoting interagency dialogue and engagement. This project supports fulfillment of DNDO's mandate to coordinate an enhanced GNDA by facilitating the development of strategic, implementation, and operational concepts and plans for nuclear detection programs, activities, and capabilities. Through this project, DNDO coordinates and integrates the roles, responsibilities, and collective goals and objectives of the interagency GNDA community and ensures that GNDA and other DHS R/N prevention activities are integrated into DHS policies, strategies, and plans. This project also coordinates and manages performance measure development and reporting, collaborates with DHS Components to create and deliver congressionally mandated reports such as the *GNDA Joint Interagency Review* and the DHS GNDA Strategic Plan of Investments.
- **GNDA Analysis:** 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 the status of current detection capabilities while assessing and prioritizing proposed architectural enhancements. Deliberate planning, modeling, and analysis of the GNDA directly contribute to effective programming and budgeting decisions which contribute to making nuclear terrorism prohibitively difficult for our adversaries.
    - *Architecture Development:* The Architecture Development Project produces and maintains a model supporting DNDO's ability to analyze current GNDA capabilities, identify vulnerabilities and gaps, make prioritization decisions, and inform planning for future GNDA capabilities. It ensures the use of common terminology, capability sets,

assumptions, and constraints supporting risk and capability assessments, capabilities-based assessments (CBA), and cost-benefit analyses of proposed GNDA portfolios. The portions of the Enterprise Architectural Framework, consisting of mission architecture and related operational models that have already been developed, and are being used to determine vulnerabilities in the GNDA, identify and quantify gaps, and support the evaluation of proposed solutions. The results of the analyses have contributed to improvement of the risk model's ability to assess systemic risk, both to the U.S. from R/N attacks and in prioritization of solutions development. The Framework also ensures the use of common terminology, capability sets, assumptions, and constraints supporting risk and capability assessments, CBAs, and cost-benefit analyses of the proposed GNDA project portfolio.

- *Adversary Threat:* DNDO elicits input from the intelligence community regarding a wide range of adversary characteristics informing the risk analysis of the GNDA and developing an adversary model. In addition, DNDO facilitates interagency discussions about weapon types and yield characteristics for input into the weapons model. Updates to the weapons model incorporate an expanded threat definition of weapons and adversary methods, and higher fidelity handling of threat signatures. Intelligence from across the USG which pertains to R/N terrorism is gathered in one place, made available to other analytic efforts, and informs senior DHS leadership regarding individual events or the historical and strategic context surrounding R/N terrorism. DNDO leads the USG in its approach to assessing the technical capabilities of the adversary and the resulting weapon designs that our defensive architecture may be confronted with. Using this information, DNDO applies the threat definition to relevant programs to support risk assessments and conduct cost trade studies for individual enhancements to the GNDA or implementation of capabilities. The result is a defensive architecture that is more closely oriented towards realistic adversaries and realistic R/N weapons.
- *Risk:* To analyze and enhance the effectiveness of GNDA implementation, DNDO uses risk assessments to measure the combined effect of the threat of, vulnerability to, and consequences of radiological and nuclear terrorism. DNDO continues to develop a suite of modeling, simulation, and assessment tools to estimate the risk from particular pathways, transport modes, threat objects, and adversaries. DNDO and DHS are able to rigorously prioritize capability gaps and potential solutions and inform the department and government-wide conversations about prioritization amongst the many threats and hazards facing our Nation. The transparency of DNDO's risk model and associated analysis contributes to risk-informed decision making processes by making the assumptions and underlying analysis clear to the end users.
- *Capabilities-Based Planning:* In order to enhance the GNDA, one must first determine current capability gaps and potential vulnerabilities and then formulate recommendations and plans to mitigate them. To accomplish these analytical tasks, DNDO organizes and facilitates collaborative activities with domestic and international partners and stakeholders in the GNDA. The CBA process has been instrumental in developing recommendations for planning, coordination, and implementing of needed capabilities, operations, and information sharing to improve the detection of

nuclear or other radioactive materials out of regulatory control. Capability needs are the basis of the development of mission needs statements (MNS) and material and non-material change request documents that serve as the foundational documents for the solutions development phase. These assessments feed strategic and operational planning and help ensure cost-effective use of limited resources to address priority detection shortfalls.

- **GNDA Solutions Management:** The GNDA Solutions Management Program works with stakeholders to develop materiel and non-materiel solutions to reduce the risk from R/N threats faced by the GNDA. As a first step in 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 MNS and concept of operations (CONOPS). These efforts focus on specific pathways, operating environments, modes of transportation, and/or specific threats.
    - *Aviation Solutions Management:* The Aviation Solutions Management Project examines ways to reduce risks from adversarial use of commercial and general aviation to conduct an R/N attack against the United States. The Aviation Solutions Management Project includes efforts to address risk within international general aviation (IGA), international commercial air cargo (ICAC), and domestic general aviation (DGA) pathways. The Aviation Solutions Management Project provides risk reduction and deterrence within IGA, ICAC, and DGA pathways against adversaries considering aviation pathways for transport of R/N weapons or materials.
    - *Interior Solutions Management:* 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. The Interior Solutions Management Project provides risk reduction and deterrence against adversaries considering interior pathways for transport of R/N weapons or materials within the United States.
    - *Land Border Solutions Management:* The Land Border Solutions Management Project gathers requirements and develops solutions to address R/N detection deficiencies and vulnerabilities at and between land border ports of entry (POE). The Land Border Solutions Management Project includes efforts to address risk within international rail and on-dock rail pathways and at border crossing and checkpoints. The Land Border Solutions Management Project seeks solutions to provide risk reduction and deterrence against adversaries considering land border pathways at and between POEs to transport R/N weapons or materials into the United States.
    - *Maritime Solutions Management:* The Maritime Solutions Management Project addresses ways to reduce the risk of an adversary using navigable waterways to conduct an R/N 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. The Maritime Solutions Management Project seeks solutions to provide risk reduction and deterrence against adversaries considering maritime pathways for transport of R/N weapons or materials into and within the United States.

- *Cross Cutting:* The Cross Cutting Project aims to address operational gaps and vulnerabilities common to multiple mission areas and pathways. The Cross Cutting Project includes airborne radiation detection and human portable detectors. The Cross Cutting Project seeks solutions to provide risk reduction and deterrence against adversaries considering one or more of multiple pathways for transport of R/N weapons or materials into and within the United States.

- **International Project:** 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 R/N detection capabilities to better inform capacity-building efforts to fill gaps in the architecture. DNDO's International Program leads USG efforts in assisting international partners in developing their own national-level R/N detection architectures, resulting in a coordinated and cost-effective approach to enhancing the exterior layer of the GNDA. DNDO coordinates the development of the exterior layer of the GNDA, centered on both characterization and prioritization of R/N detection capabilities worldwide. These efforts include targeted bilateral and multilateral outreach to foreign counterparts to raise situational awareness and enhance broader national-level R/N detection capacity building efforts.
  - *GNDA Exterior Layer Capabilities:* DNDO supports USG efforts to characterize the international GNDA – accounting for USG, international partner, and indigenous capabilities and efforts – to better guide future USG outreach and resources. This holistic characterization allows decision makers to target critical gaps while reducing unnecessary efforts or overlaps. DNDO efforts focus on conducting regional architecture analyses (to date, analyses have been completed to span the globe) in partnership with USG and multilateral partners to better understand the detection architectures in place around the world. DNDO efforts in this project area continue to make these analyses more readily available to partners to inform implementation and outreach. DNDO has led or taken a lead role in architecture analyses on every region across the globe. As a result of DNDO's efforts in this project area, USG senior leaders and foreign partners have a better understanding of global nuclear detection capabilities and are more informed to make decisions on where to receive maximum return on the limited resources committed to this mission area.
  - *International Development & Outreach:* 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., Global Initiative to Combat Nuclear Terrorism (GICNT) and International Atomic Energy Agency (IAEA)) planning and engagement efforts, DNDO 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. DNDO 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 2018, 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. DNDO led the development of the four-volume *Developing a Nuclear Detection Architecture Series* through the GICNT and assisted in the development of numerous other IAEA publications related to nuclear security. These publications are a cost-effective mechanism to provide international partners the framework necessary for planning and implementation of their own national-level architectures. Through its international development and outreach project, DNDO has reached 93 countries to provide the foundational training and awareness necessary to develop and enhance global nuclear security capabilities.

FY 2016 Key Milestone Events (Prior Year)

- Planning and Reporting: Led and published the interagency GNDA Domestic Implementation Plan.
- Planning and Reporting: Led, published, and delivered to Congress on time the GNDA Joint Annual Interagency Review.
- GNDA Analysis: Developed pathway decomposition for Maritime Non-Containerized Cargo (MNCC) CBA.
- GNDA Solutions Management Program: Refined operational alternatives to reduce identified IGA vulnerabilities and prioritized options for further analysis and implementation.
- GNDA Solutions Management Program: Developed, with Federal partners, an initial prototype ICAC insider threat 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.
- GNDA Solutions Management Program: Deployed beta-version of web-enabled Capabilities Development Framework (CDF) geographic information system GIS mapping tool for state and local assessments of R/N detection capability needs.
- GNDA Solutions Management: Completed technical analysis related to providing USBP's Border Patrol Search, Trauma, and Rescue (BORSTAR) teams and Border Patrol Tactical (BORTAC) units with R/N detection capabilities.
- International: Completed International Nuclear Detection Architecture Reports for Bulgaria, Georgia, Kazakhstan, Mongolia, Turkey, and Ukraine: Illicit Trafficking Scenarios.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Planning and Reporting: Lead the revision of the DHS GNDA Implementation Plan.
- Planning and Reporting: Lead, publish, and deliver to Congress on time the GNDA Joint Annual Interagency Review.
- GNDA Solutions Management Program: Complete a systems threat review to analyze existing detection systems in air cargo pathways at international LPODs and APOEs to identify how those systems could be leveraged during surge operations to detect R/N threats.
- GNDA Solutions Management Program: Deliver at least 15 Threat and Hazard Identification Assessment (THIRA) R/N technical assistance workshops to assist state and local stakeholders in evaluation of current R/N detection capability gaps.
- GNDA Solutions Management Program: Fully deploy the Capabilities Development Framework (CDF) mapping tool for state and local strategic planning use, including supporting THIRA and State Preparedness Report (SPR) processes.

- GNDA Solutions Management: Complete international rail commerce stream pathway analysis and prepare risk reduction solution(s) recommendation. Recommendations may include: new technologies; maturation and testing new and/or improved systems; supporting system procurement; and/or developing new techniques, procedures, and protocols which further mitigate R/N risk without disrupting the commerce stream.

FY 2018 Planned Key Milestone Events (Budget year)

- Planning and Reporting: Lead, publish, and deliver to Congress as required the GNDA Joint Annual Interagency Review.
- GNDA Solutions Management: Develop customized versions of the ICAC Insider Threat tool for specific end-users and support initial implementation of those tools.
- GNDA Solutions Management: Develop DNDO implementation strategy and plan for R/N detection baseline capability metrics.
- GNDA Solutions Management: Deliver at least 15 THIRA/SPR R/N technical assistance workshops to assist the national network of fusion analysts in evaluating and sharing R/N threat information.

Delayed Milestones

- N/A

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	$21,000	$17,000	$15,758	$15,578	$15,937
Obligations	$17,877	$16,010	$15,378	$15,578	$15,937

FY2014 and FY2015 obligation data compiled using final spend plans owing to retrieval-challenged data housed in legacy accounting system.

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2016		
GNDA Analysis: Completed development of the Urban Area Nuclear Detection Architecture Template for the GNDA	1st QTR	2nd QTR
GNDA Analysis: Developed a high-level architecture description of the impact of the U.S. Third Coast on the GNDA	2nd QTR	3rd QTR
GNDA Analysis: Conducted capability gap (Stage 0) outreach with the USCG, as part of a biennial review of current and future capability needs analysis	1st QTR	4th QTR

Research & Development Description	Planned Start Date	Planned Completion
GNDA Solutions Management: Conducted analysis of operational alternatives to reduce identified IGA vulnerabilities	1st QTR	4th QTR
GNDA Solutions Management: Characterized the interior layer by improving the CDF assessment flexibility and placing the CDF on a web-enabled platform to improve nationwide stakeholder access to the tool	1st QTR	4th QTR
International: Co-chaired the IAEA's International Coordination Meeting to discuss good practices and challenges in developing a nuclear security detection architecture (NSDA).	1st QTR	4th QTR
FY 2017		
Planning and Reporting: Publish the DHS GNDA Implementation Plan	1st QTR	4th QTR
Planning and Reporting: Coordinate the development and approval of the DNDO Deterrence Strategy	1st QTR	4th QTR
GNDA Analysis: Conduct capabilities-based analysis on the International Commercial Air Cargo (ICAC) threat vector	1st QTR	3rd QTR
GNDA Solutions Management: Finalize detailed international rail commerce stream analysis to identify unaccounted risk mitigation activities and support potential improvements in the pathway	1st QTR	4th QTR
GNDA Solutions Management: Develop U.S. Border Patrol Checkpoint JRC and systems engineering milestone requirements related to solutions analysis.	1st QTR	4th QTR
International: Conduct one iteration of the R/N Smuggling and Detection Awareness Course for Law Enforcement in Bangkok, Thailand and one in Budapest, Hungary	1st QTR	4th QTR
FY 2018		
Planning and Reporting: Consolidate and harmonize the GNDA International and Domestic Implementation Plans	1st QTR	4th QTR
GNDA Solutions Management: Develop R/N detection baseline capability metrics to measure the development of capabilities within the GNDA interior domestic layer	1st QTR	4th QTR
GNDA Solutions Management: Continue ODR systems engineering process and detailed analysis and	1st QTR	4th QTR

Research & Development Description	Planned Start Date	Planned Completion
solution(s) selection to meet all stakeholder requirements		
GNDA Solutions Management: Conduct an AoA to assess materiel and non-materiel solutions to reduce R/N smuggling risk in the MNCC pathway	4th QTR	4th QTR
International: Conduct one iteration of the R/N Smuggling and Detection Awareness Course for Law Enforcement in Bangkok, Thailand; Budapest, Hungary; and Gaborone, Botswana.	1st QTR	4th QTR

Type of Research

Not Applicable

Technology Readiness Level

Not Applicable

Transition Plans

Not Applicable

Transformational Research and Development - PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Transformational Research and Development	-	-	$64,684	-	-	$63,943	-	-	$60,581	-	-	($3,362)
Total	**-**	**-**	**$64,684**	**-**	**-**	**$63,943**	**-**	**-**	**$60,581**	**-**	**-**	**($3,362)**
Subtotal Discretionary - Appropriation	-	-	$64,684	-	-	$63,943	-	-	$60,581	-	-	($3,362)

Transformational Research and Development – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$64,684		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$64,684**	**$63,943**	**$60,581**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$5,327	$6,335	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$70,011**	**$70,278**	**$60,581**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$70,011**	**$70,278**	**$60,581**
Obligations (Actual/Projections/Estimates)	$62,844	$70,278	$60,581
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Transformational Research and Development – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$64,684**
FY 2016 Revised Enacted	**-**	**-**	**$64,684**
FY 2017 Annualized CR	**-**	**-**	**$63,943**
FY 2018 Base Budget	**-**	**-**	**$63,943**
FY 2018 Current Services	**-**	**-**	**$63,943**
Transformational Research and Development	-	-	($3,362)
Total, Program Decreases	**-**	**-**	**($3,362)**
FY 2018 Request	**-**	**-**	**$60,581**
FY 2017 TO FY 2018 Change	**-**	**-**	**($3,362)**

PPA Description

DNDO'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 R/N detection and nuclear forensics methods, components, and systems; and/or significantly reduce the operational burden of these technologies. DNDO 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 aligned with goals and priorities outlined in the *DNDO Transformational and Applied Research Roadmap and Implementation Strategy, Fiscal Years 2016 – 2021*, are issued as competitive awards open to researchers from all sectors: government laboratories, academia, and private industry. The transformational research efforts leverage the qualities and advantages of all three sectors to develop capability. 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.

Transformational Research and Development – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Transformational Research and Development	$64,684	$63,943	$60,581	($3,362)
Total	**$64,684**	**$63,943**	**$60,581**	**($3,362)**
Discretionary - Appropriation	$64,684	$63,943	$60,581	($3,362)

Transformational Research and Development – PPA
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$106	$147	$150	$3
25.1 Advisory and Assistance Services	$4,788	$2,577	$2,371	($206)
25.5 Research and Development Contracts	$46,467	$50,716	$46,570	($4,146)
41.0 Grants, Subsidies, and Contributions	$13,323	$10,503	$11,490	$987
Total - Non Pay Object Classes	**$64,684**	**$63,943**	**$60,581**	**($3,362)**

Transformational Research and Development – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Academic Research Initiative	$11,496	$11,343	$12,403	$1,060
Exploratory Research	$21,977	$24,581	$25,045	$464
Advanced Technology Demonstration	$27,254	$24,723	$23,133	($1,590)
Small Business Innovation Research*	$3,957	$3,296	-	($3,296)
Total – Non Pay Cost Drivers	**$64,684**	**$63,943**	**$60,581**	**($3,362)**

*Small Business Innovation Research (SBIR) will be funded in FY 2018 to meet legislative requirement. SBIR Funding shown in FY 2016 and FY 2017 only reflects Transformational Research and Development funding. Actual amount of R&D set aside for small business is determined in the year of execution after assessing the appropriations, and comparison of responses to DNDO's annual announcement for proposals to DNDO mission requirements.

NARRATIVE EXPLANATION OF CHANGES

DNDO balanced program requirements while supporting the FY 2018 President's Budget. For explanation of program changes, see Justification of Program Changes.

Through the Transformational and Applied Research (TAR) Directorate DNDO manages three types of R&D: basic research, applied research, and technology development. The R&D types correspond to the Academic Research Initiative (ARI), Exploratory Research (ER), and Advanced Technology Demonstration (ATD) programs, respectively; with a portion of the total R&D set aside for small businesses. DNDO strives to maintain a balanced funding profile across the different types of R&D to ensure a robust technology pipeline that can support continual technology transition. Although not mandated, a funding profile of 20% basic research, 40% applied research, and 40% technology development has historically been effective. Within the planning cycle, this portfolio is maintained within a few percent per program. Slightly greater deviations are seen in the execution year for multiple reasons including:

- The actual cost of new proposed work (e.g., through a Broad Agency Announcement) was different than originally anticipated;
- Work was terminated because the R&D results were not as impactful as originally expected;
- An increase in current year spending could provide beneficial results such as an accelerated technology transition; or

- The logistics of contracting and the uncertainty in the budget cycle can result in certain projects being funded over different fiscal year boundaries.

Transformational Research and Development – PPA
Research and Development
Technology Readiness Level Exhibit

Project Description:

The Advanced Technology Demonstration (ATD) program performs accelerated development, characterization, and demonstration of leading-edge technologies that address critical gaps in nuclear detection capabilities.

- **Problem:** There is a need to identify, explore, develop, and demonstrate scientific and technological approaches that address gaps in the GNDA; significantly improve the performance of R/N detection and nuclear forensics methods, components, and systems; and/or significantly reduce the operational burden of these technologies. Following Proof of Concept demonstrations under the Exploratory Research Project, there is a need to further advance the promising technologies into the next stage of development and system-level integration.
- **Solution:** 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:
- **Impact:** Through this program, technology is matured and integrated. Robust data sets are collected which define the performance envelope of the existing technology and is available to support requirements development efforts for future acquisition programs. The culminating Technology Demonstration and Characterization phase is important in that these define the tangible technological benefits that can be achieved with real-world, integrated systems. Demonstration units are an essential tool in transitioning promising technologies because they are generally the first time operational end users get to interact with a new technology.

Sub Projects

- *Shielded Nuclear Alarm Resolution (SNAR):* The SNAR sub-project develops and characterizes advanced technologies required to resolve alarms and to detect Special Nuclear Material (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 Nuclear and Radiological Imaging Platform (NRIP) project (see below). The final report for the second PTU was completed in early FY 2016. In collaboration with the United Kingdom Home Office, the final report for the third PTU was completed in FY 2016.
- *Airborne Radiological Enhanced-sensor System (ARES) Project:* The ARES sub-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 coastal environments with a 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 2017 with a final report to assess technology transition potential.
- *Nuclear and Radiological Imaging Platform (NRIP):* The NRIP sub-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 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. The characterization of the Passport NRIP system at Conley Terminal will be completed in FY 2017 and an operational pilot with CBP at Conley Terminal is planned for FY 2018.

- *Radiation Awareness and Interdiction Network (RAIN):* The RAIN sub-project, an initiative closely tied to the Securing the Cities 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 to gather the operational requirements, conditions and constraints in monitoring traffic and vehicles 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):* 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. A formal operational assessment was completed in FY 2016, with the final report provided in January 2017. The outcome of the assessment supported a technology transition of ERNIE from DNDO's Transformational and Applied Research Directorate to its Product Acquisition and Deployment Directorate.

- *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 sub-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 was issued for the proposed research and development and four awardees selected across two topic areas. In FY 2017, each proposed device design will undergo review according to the performance assessment methods described above. In FY 2018, each of the four awardees will assemble a performance test unit to undergo a Characterization Readiness Review in preparation for demonstration and characterization for technology transition potential in FY 2019.
- *Mobile Urban Radiation Search (MURS):* The goal of the MURS sub-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. As an interested end user, the Federal Bureau of Investigation is partnered with DNDO to regularly exercise the MURS system to provide realistic operational constraints and feedback during the spiral development. The MURS Project also leverages the Defense Advanced Research Projects Agency 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 DNDO missions such as the Mobile Detection Deployment Units (MDDU) 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 continue in FY 2018 with the development of an optimized prototype by a commercial vendor. It will conclude in FY 2019 with the demonstration and operational assessment of the optimized prototype.
- *High-Throughput Integrated Rail Scanner (HIRS):* The planned HIRS sub-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 CBP for future rail

scanning operations. This project will initiate in FY 2017. Prototypes will be characterized in FY 2020 leading to a technology transition in FY 2021.

- *SIGMA:* The SIGMA sub-project is a multi-pronged approach to the wide area monitoring and search problem for R/N threats. The central tenets are (1) foster commercial availability of inexpensive, wearable detectors far superior to available spectroscopic "pagers" (SPRDs); (2) incorporate cutting edge, USG-funded detection algorithms; and (3) link the detectors via smartphone to a cloud network and provide system-level monitoring in addition to local read-out. The project was initiated by Defense Advanced Research Project Agency (DARPA). In FY 2018, SIGMA will begin the transition to DNDO, while being jointly administered by DARPA and DNDO.

FY 2016 Key Milestone Events (Prior Year)

- SNAR Sub-Project: Completed the final report of the second SNAR system.
- NRIP Sub-Project: Completed the final characterization report on the Multi-Mode Passive Detection System.
- RAIN Sub-Project: Completed vendor development and test phase and conducted characterization readiness review for the three developed technologies. Selected and prepared a site for government characterization activities. Coordinated with New York Police Department stakeholders on the operational demonstrations of the systems.
- MURS Sub-Project: Completed integration of first MURS prototype. Deployed MURS prototype with Federal Bureau of Investigation (FBI) and Department of Energy (DOE) partners at the Nuclear Security Summit.
- WIND Sub-Project: Executed kick-off with selected vendor(s) and begin work towards concept preliminary design. Conducted first spiral development phase with vendors to facilitate early incorporation of end-user feedback.
- ERNIE Sub-Project: Completed operational pilot at Virginia International Gateway.
- ARES Sub-Project: Completed vendor reports on aerial detection hardware and algorithms.

FY 2017 Planned Key Milestone Events (Year of Execution)

- SNAR Sub-Project: Complete SNAR program final report that will present a full compilation of results from technologies characterized by the program.
- NRIP Sub-Project: Conduct Technology Demonstration and Characterization of Passport NRIP system at Conley Terminal.
- HIRS Sub-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.
- RAIN Sub-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.

- MURS Sub-Project: Integrate MURS system into an FBI vehicle to further operational development. Participate in FBI deployments for the Presidential Inauguration, State of the Union Address, and other events to refine the operational usability of the developmental technologies.
- WIND Sub-Project: Complete Spiral development event to provide end-user feedback on initial vendor designs; and complete supporting STR to evaluate effectiveness of proposed vendor designs in detecting threats. Finalize analysis and characterization plans to evaluate prototype performance during Technical Demonstration and Characterization in FY 2019.
- ARES Sub-Project: Complete Government characterization of ARES system algorithms, and generate the final characterization report.
- ERNIE Sub-Project: Complete Operational Assessment report.

FY 2018 Planned Key Milestone Events (Budget year)

- NRIP Sub-Project: Operational pilot with CBP at Conley Terminal; complete the NRIP program final report.
- HIRS Sub-Project: Release Broad Agency Announcement.
- RAIN Sub-Project: Operational demonstration of RAIN system at Lincoln Tunnel, New York.
- MURS Sub-Project: License MURS developments to a commercial vendor and include the technology in product acquisition analysis of alternatives for federal acquisition.
- WIND Sub-Project: Complete critical design reviews with WIND vendors. Perform Characterization Readiness Review in preparation for Technical Demonstration and Characterization in FY 2019.
- ERNIE Sub-Project: Initial phased deployment in conjunction with CBP.
- SIGMA Sub-Project: Complete deployment of SIGMA to New York/New Jersey (NY/NJ) Port Authority.

Delayed Milestones

- N/A

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	$27,117	$23,672	$27,254	$24,723	$23,133
Obligations	$27,117	$23,572	$21,489	$24,723	$23,133

FY2014 and FY2015 obligation data compiled using final spend plans owing to retrieval-challenged data housed in legacy accounting system.

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2016		
Shielded Nuclear Alarm Resolution (SNAR)	2008	2017
Airborne Radiological Enhanced-Sensor System (ARES)	2012	4th QTR
Nuclear and Radiological Imaging Platform (NRIP)	2012	2018
Radiation Awareness and Interdiction Network (RAIN)	2014	2017
Enhanced Radiological Nuclear Inspection and Evaluation (ERNIE)	2014	2017
Wearable Interdiction Nuclear Detection (WIND) Mobile Urban Radiation Search (MURS)	2015 2015	2018 2019
FY 2017		
Shielded Nuclear Alarm Resolution (SNAR)	2008	2017
Nuclear and Radiological Imaging Platform (NRIP)	2012	2018
Radiation Awareness and Interdiction Network (RAIN)	2014	2017
Enhanced Radiological Nuclear Inspection and Evaluation (ERNIE)	2014	2017
Wearable Interdiction Nuclear Detection (WIND)	2015	2018
Mobile Urban Radiation Search (MURS)	2015	2019
High-Throughput Integrated Rail Scanner (HIRS)	2017	2021
FY 2018		
Nuclear and Radiological Imaging Platform (NRIP)	2012	2018
Wearable Interdiction Nuclear Detection (WIND)	2015	2018
Mobile Urban Radiation Search (MURS)	2015	2019
SIGMA	2018	2019
High-Throughput Integrated Rail Scanner (HIRS)	2017	2021

Type of Research

Applied

Technology Readiness Level

The Advanced Technology Demonstration program generally matures technology from TRL 5 to 7.

Transition Plans

The ATD project develops demonstration units that may result in several transition outcomes. They lead to the possibility of direct commercialization. They provide the basis for forming Technical Transition Agreements with DNDO for federal acquisition. They also identify component technologies that require further maturation under the Exploratory Research project.

Project Description:

The Exploratory Research (ER) program explores innovative, high-risk technologies that address gaps in the GNDA, provide improvements in performance or reduction in cost of R/N detection capabilities, and enhance nuclear forensics capabilities.

- **Problem:** There is a need to identify, explore, develop, and demonstrate scientific and technological approaches that address gaps in the GNDA; significantly improve the performance of R/N detection and nuclear forensics methods, components, and systems; and/or significantly reduce the operational burden of these technologies.
- **Solution:** 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 R/N detection capabilities; and
  - Improve nuclear forensics capabilities.
- **Impact:** Capabilities developed under the ER program can provide enabling technologies in support of the ATD program or directly spur commercial development.

Sub Projects

- *Materials Research and Support Technology (Materials):* The Materials Sub-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.
- *Radiation Detection Technology (Radiation):* The Radiation Sub-Project emphasizes investigating novel approaches to greatly improve the ability to detect, identify, and locate threat materials based on their intrinsic radiological signatures.
- *Shielded SNM (Shielding):* The Shielding Sub-Project addresses the critical challenge of being able to detect SNM and other threats even when heavily shielded or masked.
- *Advanced Analytics (Analytics):* The Analytics Sub-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.
- *Nuclear Forensics (Forensics):* The Forensics Sub-Project directly coordinates with DNDO's NTNFC mission to execute research and development to discover new forensics signatures of R/N material and to also develop the tools enabling comprehensive and timely analytical results.

FY 2016 Key Milestone Events (Prior Year)

- Initiated six new R&D activities under the ER program addressing the challenging gaps in the GNDA and TNF.

- Completed 19 Feasibility Evaluations and nine Proof of Concept Demonstrations for technologies addressing the challenging gaps in the GNDA and TNF.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Initiate up to 17 new R&D activities under the ER program addressing the challenging gaps in the GNDA and TNF.
- Transition technologies to Advanced Technology Demonstrations or commercial development as needed.

FY 2018 Planned Key Milestone Events (Budget year)

- Initiate up to 20 new R&D activities under the ER program addressing the challenging gaps in the GNDA and TNF.
- Transition technologies to Advanced Technology Demonstrations or commercial development as needed.

Delayed Milestones

- N/A

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	$25,337	$24,126	$21,977	$24,581	$25,045
Obligations	$25,337	$23,847	$21,331	$24,581	$25,045

FY2014 and FY2015 obligation data compiled using final spend plans owing to retrieval-challenged data housed in legacy accounting system.

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2016		
Discrete Depth Reconstruction Algorithm for Radiography	4th QTR	2nd QTR FY17
Wafer-Level Processing of thallium bromide (TlBr)	4th QTR	3rd QTR FY19
DFM for Low-Cost Processing and Packaging of Scintillators	4th QTR	4th QTR FY19
Pre-Processing Module for Gamma-ray Spectra	4th QTR	4th QTR FY19
Modular High-Fidelity Calibration of Gamma-ray Spectra	3rd QTR	3rd QTR FY19
PreCalc Simulation of Pu Processing	4th QTR	4th QTR FY21
FY 2017		
GADTR Algorithm for Radiography	1st QTR	4th QTR FY18
Automated Fabrication Chain for TlBr	1st QTR	1st QTR FY20
New Starts: Future Solicitation Topics	4th QTR	4th QTR FY20
FY 2018		
New Starts: Future Solicitation Topics	4th QTR	4th QTR FY21

Type of Research

Applied

Technology Readiness Level

Levels 2-5

Transition Plans

Successful ER technologies and concepts may transition to support subsequent ATD projects or directly spur commercial development.

Project Description:

The Academic Research Initiative (ARI) program has two primary objectives: 1) Advance fundamental knowledge in the sciences and engineering related to radiological and nuclear threat detection and forensics needed to solve long-term, high-risk challenges; and 2) Develop the next generation workforce in the nuclear sciences, engineering, and related fields.

- **Problem:** Radiological and nuclear detection and nuclear forensics is multi-disciplinary. Areas traditionally associated with R/N expertise have aging subject matter experts and shrinking funding. Areas not traditionally associated with R/N expertise can provide new perspectives but are not necessarily aware of their potential impact.
- **Solution:** Provide continued investment in fundamental science, engineering, and related fields to build capability at the university level. Students supported by the project are provided funding to help them in their work toward undergraduate and graduate degrees. The ARI program is also reaching out to non-traditional areas to solicit their ideas to solving R/N detection and forensics challenges.
- **Impact:** Since the ARI program was started in 2007, it has awarded over 100 grants to more than 55 academic institutions and sponsored over 160 students. These grants have resulted in over 580 journal publications which have increased the fundamental knowledge in areas such as nuclear engineering, physics, and chemistry, as well as other disciplines not traditionally associated with R/N detection like social sciences, deterrence theory, and applied mathematics.

The ARI Program follows established academic practices of peer review and competitive research awards. These practices include conducting an annual program review that enables faculty and student researchers funded by these competitively awarded DHS grants to present their latest finding to both DHS program managers as well as their peers. Presentations follow accepted practices used at scientific conferences: professors, post-doctoral research associates and students give scheduled talks in topic area sessions; students present posters at forums designed to foster face-to-face interactions with researchers.

Sub Project

- *Materials* – 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 aims to understand the fundamental properties of radiation sensing materials, such as mechanisms of light production in scintillator materials and charge mobility and lifetimes in semiconductor materials.
- *Advanced Analytics* – This sub-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 real-time gamma-ray imaging and radionuclide identification and application of machine learning 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.

- *Nuclear Forensics* – This sub-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.
- *Radiation Techniques* – Research in this area explores radically new approaches to threat detection, eventually leading to sensor or detection system concepts that are highly sensitive to R/N 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.
- *Shielded SNM Detection* – 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.

FY 2016 Key Milestone Events (Prior Year)

- Funded 46 research efforts at 31 universities to advance fundamental knowledge to address long-term, high-risk challenges in R/N Detection and Forensics.
- Issued a Notice Of Funding Opportunity (NOFO) with four topic areas and awarded 10 new research grants.
- Held annual ARI Program Review which hosted 46 grants to present their research to DNDO and interagency audiences.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Hold annual ARI Program Review which will host 45 grantees to present their research to DNDO and interagency audiences.
- Fund 45 research efforts at 29 universities to address long-term, high-risk challenges in R/N Detection and Forensics.

FY 2018 Planned Key Milestone Events (Budget year)

- Release a NOFO announcement to solicit new proposals for research, and award up to 15 new grants.
- Hold annual ARI Program Review to host over 40 grants to present their research to DNDO and interagency audiences.
- Fund over 40 research efforts at over 30 universities to address long-term, high-risk challenges in R/N Detection and Forensics.

Delayed Milestones

- N/A

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	$9,834	$10,612	$11,496	$11,343	$12,403
Obligations	$9,831	$10,612	$9,849	$11,343	$12,403

FY2014 and FY2015 obligation data compiled using final spend plans owing to retrieval-challenged data housed in legacy accounting system.

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2016		
Synthesis and Evaluation of Novel Plastic Scintillator Materials	4th QTR	4th QTR FY21
Methylammonium Lead Halide Semiconductor for Dual Gamma/Neutron Sensing	4th QTR	4th QTR FY21
Investigation of Detectors, Algorithms, and Systems for SNM Detection	4th QTR	4th QTR FY21
Portable, kHz Laser Driven Accelerator	4th QTR	4th QTR FY21
Compact High Repetition Rate Laser Driver for Detection of SNM	4th QTR	4th QTR FY21
Fast Neutron Detection for Active Interrogation	4th QTR	4th QTR FY21
Active Interrogation with Superheated Emulsions	4th QTR	4th QTR FY21
Comprehensive Modeling of Detector Performance to Support Threat Detection at Checkpoints	4th QTR	4th QTR FY21
Enhancing Search Capabilities by Fusing Radiological and Non-Radiological Signatures	4th QTR	4th QTR FY21
Machine Learning of Nuclear Forensic Data	4th QTR	4th QTR FY21
FY 2017		
No New Starts in FY 2017		

Research & Development Description	Planned Start Date	Planned Completion
FY 2018		
Notice of Funding Opportunity for up to 15 new grants		

Type of Research

Basic

Technology Readiness Level

Level 1

Transition Plans

The ARI program funds grants that are low TRL (1-3). These grants often are investigating fundamental concepts and only start to develop applications for the technology. Research executed in ARI grants helps determine the feasibility of the technology to help the mission. Those concepts and technologies that show feasibility can transition to Exploratory Research for further development, either from additional development in academia or the commercial sector.

Project Description:

The Small Business Innovation Research (SBIR) program enables technological innovation by strengthening the role of small business concerns in federally funded R&D. The DNDO SBIR program is specifically focused on meeting Federal research and development needs for R/N detection.

- **Problem:** There is a need to identify, explore, develop, and demonstrate scientific and technological approaches that address gaps in the GNDA; significantly improve the performance of R/N detection and nuclear forensics methods, components, and systems; and/or significantly reduce the operational burden of these technologies.
- **Solution:** The SBIR program stimulates the technological innovation by strengthening the role of innovative small business concerns in federally funded R&D. 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.
- **Impact:** The DNDO SBIR program transitions near-term solutions, supporting the gaps in the GNDA, into a commercial product or service.

Under the SBIR Program, Phase I efforts are six months long and result in a feasibility evaluation. Phase II efforts are two years long and result in a Proof of Concept Demonstration. The final phase, Phase III, transitions the new technology to a commercial product.

Sub Projects

- *Embedding of Advanced Search Technique for Detect, Locate, and Track for Pedestrian-based Search*: Advancement of search techniques to improve the ability to localize and track a radiation source anomaly.
- *Miniaturization of Support Infrastructure for Non-Intrusive Inspection X-Ray Systems:* Aims to shrink the footprint for support infrastructure necessary to run high energy x-ray sources.
- *Stable Semiconductor Modules as Core Component in Pager Radiation Detectors*: Development of an advanced core detector module for the next generation of radiation pager detectors.
- *Mass/Shielding Anomaly Passive Detector Module*: Develop an innovative system to detect anomalous dense masses in conveyances without the use of irradiation technologies.
- *Smartphone/Smart device Toolkit for Virtual and Actual Radiation Detection, Identification, and Localization*: Development and demonstration of a user-friendly and straightforward smartphone/smart device toolkit for radiation detection, identification, and localization based on the presence of a simulated or virtual radiological source.

- *Plastic Composite Based Scintillators for MultiSignature Radiation Detectors*: Demonstration of a simple-to-fabricate-and-integrate detector technology that combines gamma and neutron sensitivity with good efficiency at a reduced cost compared to the current commercial-off-the-shelf (COTS) scintillators.
- *Portable Linear Accelerator (Linac) for Active Interrogation Systems for Radiological Gamma Isotope Source Replacement*: Development and commercialization of a portable accelerator for detection of shielded SNM and replacement of radiological gamma isotope sources currently used for commercial non-medical applications.
- *Accelerated Crystal-Size Scale-Up of Thallium-based Scintillator*: Aims to develop a new gamma- and neutron-detecting scintillator material with high energy resolution and detection efficiency, and the "scaled-up" processes necessary to produce material crystals of a marketable size.
- *Unattended Radiation Detection Systems*: Aims to develop a system capable of radiation detection and analysis, capturing relevant contextual information (e.g., video or pictures) from the surrounding environment, and transmitting the all relevant information, but have low-energy requirements to facilitate long periods of operation without direct operator interface.

FY 2016 Key Milestone Events (Prior Year)

- Initiated seven SBIR Phase I, five SBIR Phase II, and one SBIR Phase III projects of research capable of meeting GNDA end-user needs.
- Completed seven Feasibility Evaluations and six Proof of Concept Demonstrations.
- Transitioned new technologies to the open market or GNDA end-users.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Initiate up to six SBIR Phase I, four SBIR Phase II, and one SBIR Phase III projects of research capable of meeting GNDA end-user needs.
- Conclude SBIR Phase I projects initiated in FY 2016.
- Conclude SBIR Phase II projects initiated in FY 2015.
- Transition new technologies to the open market or GNDA end-users.

FY 2018 Planned Key Milestone Events (Budget year)

- Initiate up to six SBIR Phase I, four SBIR Phase II, and one SBIR Phase III projects of research capable of meeting GNDA end-user needs.
- Conclude SBIR Phase I projects initiated in FY 2017.
- Conclude SBIR Phase II projects initiated in FY 2016.
- Transition new technologies to the open market or GNDA end-users.

Delayed Milestones

- N/A

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	$1,991	$2,046	$3,957	$3,296	
Obligations	$1,991	$2,045	$3,957	$3,296	

FY2014 and FY2015 obligation data compiled using final spend plans owing to retrieval-challenged data housed in legacy accounting system. Small Business Innovation Research (SBIR) will be funded in FY 2018 to meet legislative requirement. Actual amount of R&D set-aside for small business is determined in the year of execution after assessing the appropriations, and comparison of responses to DNDO's annual announcement for proposals to DNDO mission requirements.

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2016		
Phase I: Smartphone-based Radiation Analysis and Personnel Training Toolkit for Operators	4th QTR	2nd QTR FY17
Phase I: Radiation and Nuclear Detection Smart-device User Interface and Training Suite	4th QTR	2nd QTR FY17
Phase I: Multi-Signature Composite Detector	4th QTR	2nd QTR FY17
Phase I: Large Volume Composite Scintillators	4th QTR	2nd QTR FY17
Phase I: Plastic-Crystal Composite Scintillator for Multi-Signature	4th QTR	2nd QTR FY17
Phase I: Portable Linear Accelerator for Replacement of Radioactive Sources	4th QTR	2nd QTR FY17
Phase I: The Accelerator in a Suitcase for Isotope Replacement	4th QTR	2nd QTR FY17
Phase II: Shielded SNM Detection with Gravity Gradiometry	3rd QTR	3rd QTR FY18
Phase II: Personal Neutron Detector Based on Cadmium Telluride	3rd QTR	3rd QTR FY18
Phase II: Personal Semiconductor Neutron Detector Based on Lithium Indium Diselenide	3rd QTR	3rd QTR FY18
Phase II: Stable Tl-Based Semiconductor Modules for Radiation Detection	3rd QTR	3rd QTR FY18

Research & Development Description	Planned Start Date	Planned Completion
Phase II: Thallium Bromide Detectors for Radiation Pagers	3rd QTR	3rd QTR FY18
Phase III: Embedded Algorithms for Localization and Tracking	4th QTR	3rd QTR FY18
FY 2017		
Phase III: Portable High-Intensity X-Ray Source Based on a 10 MeV Superconducting Electron Linac	3rd QTR	1st QTR FY19
Phase I New Start: Accelerated Crystal-Size Scale-Up of Thallium-based Scintillator	3rd QTR	1st QTR FY18
Phase I New Start: Unattended Radiation Detection Systems	3rd QTR	1st QTR FY18
Phase II: Phase II Contracts Resulting from FY 2016 Phase I Activities	3rd QTR	3rd QTR FY19
FY 2018		
Phase I New Starts: Future Solicitation Topics	3rd QTR	1st QTR FY19
Phase II: Phase II Contracts Resulting from FY 2017 Phase I New Starts	2nd QTR	2nd QTR FY20

Type of Research

Developmental

Technology Readiness Level

Levels 4-7

Transition Plans

The primary objective of the SBIR program, at the whole-of-government level, is for new innovative products to reach the consumer market towards one or more identified end users – i.e., "commercialization." The DNDO SBIR program also seeks projects which can meet R&D needs identified by end-users and analysts, as well as the development of components which can be integrated into larger projects like Advanced Technology Demonstrations. Aspects of the technologies developed under SBIR will support and can further augment technologies of the Exploratory Research Program and Advanced Technology Demonstration program.

Detection Capability Development - PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Detection Capability Development	-	-	$21,029	-	-	$20,788	-	-	$15,155	-	-	($5,633)
Total	**-**	**-**	**$21,029**	**-**	**-**	**$20,788**	**-**	**-**	**$15,155**	**-**	**-**	**($5,633)**
Subtotal Discretionary - Appropriation	-	-	$21,029	-	-	$20,788	-	-	$15,155	-	-	($5,633)

Detection Capability Development-PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$21,029		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$21,029**	**$20,788**	**$15,155**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$9,837	$3,878	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$30,866**	**$24,666**	**$15,155**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$30,866**	**$24,666**	**$15,155**
Obligations (Actual/Projections/Estimates)	$26,360	$24,666	$15,155
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Detection Capability Development – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$21,029**
FY 2016 Revised Enacted	**-**	**-**	**$21,029**
FY 2017 Annualized CR	**-**	**-**	**$20,788**
FY 2018 Base Budget	**-**	**-**	**$20,788**
FY 2018 Current Services	**-**	**-**	**$20,788**
Detection Capability Development	-	-	($5,633)
Total, Program Decreases	**-**	**-**	**($5,633)**
FY 2018 Request	**-**	**-**	**$15,155**
FY 2017 TO FY 2018 Change	**-**	**-**	**($5,633)**

PPA Description

The Detection Capability Development Program incorporates the user requirements of DHS's operational components into R/N detection systems. It achieves this by coordinating its integrated lifecycle management and systems engineering lifecycle activities with the end-user community and managing the task execution of DNDO's SDP.

Recognizing that innovation can originate in a variety of sectors, DNDO has adopted a "commercial first" approach that gives preference for solutions available in the private sector marketplace. Using this approach, DNDO 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.

Adjustments to Base Justification

Not Applicable

Detection Capability Development – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Detection Capability Development	$21,029	$20,788	$15,155	($5,633)
Total	**$21,029**	**$20,788**	**$15,155**	**($5,633)**
Discretionary - Appropriation	$21,029	$20,788	$15,155	($5,633)

Detection Capability Development – PPA
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$17	$22	$21	($1)
25.1 Advisory and Assistance Services	$8,812	$9,682	$7,129	($2,553)
25.2 Other Services from Non-Federal Sources	-	$217	-	($217)
25.3 Other Goods and Services from Federal Sources	$10,043	$10,867	$8,005	($2,862)
25.5 Research and Development Contracts	$2,157	-	-	-
Total - Non Pay Object Classes	**$21,029**	**$20,788**	**$15,155**	**($5,633)**

Detection Capability Development – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
RPM Replacement	$4,105	$4,875	$6,292	$1,417
On Dock Rail	$5,414	$3,250	$0	($3,250)
International Rail	$1,646	$3,850	$3,357	($493)
Maritime Non-Containerized Cargo	$0	$5,094	$2,790	($2,304)
Small Vessel Standoff Detection	$0	$3,719	$2,216	($1,503)
Other Costs	$9,864	$0	$500	$500
Total Non Pay Cost Drivers	**$21,029**	**$20,788**	**$15,155**	**($5,633)**

NARRATIVE EXPLANATION OF CHANGES

DNDO balanced program requirements while supporting the FY 2018 President's Budget. For explanation of program changes, see Justification of Program Changes.

Detection Capability Development – PPA
Research and Development
Technology Readiness Level Exhibit

Project Description:

The Detection Capability Development Program incorporates the user requirements of DHS's operational components into R/N detection systems. It achieves this by coordinating its integrated lifecycle management and systems engineering lifecycle activities with the end-user community and managing the task execution of DNDO's SDP.

Recognizing that innovation can originate in a variety of sectors, DNDO has adopted a "commercial first" approach that gives preference for solutions available in the private sector marketplace. Using this approach, DNDO 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.

Sub Project:

- *3He Alternative Implementation Backpack (HAIBP):* The ^{3}He Alternative Implementation Backpack (HAIBP) program is a pre-ADE 2A program using test and evaluation results to integrate ^{3}He alternative neutron detection technologies into deployable detection systems. The National shortage of ^{3}He requires DNDO to procure an alternative backpack solution for radiological and nuclear (R/N) detection. *DHS Special Notice Regarding Future Use of Helium-3 (*^{3}He*) Gas for Neutron Detection*, May 2014, dictates that R/N Detection manufacturers pursue alternative He^{3} solutions. ^{3}He is integral to neutron detection in R/N detection backpacks. This project will identify and facilitate the development of ^{3}He alternative R/N detection technology that transitions DHS away from ^{3}He -dependent systems. The ^{3}He alternative solution will result in the fielding of a wearable R/N detector system with expansion capability to perform identification.
- *Radiation Portal Monitor Replacement Program (RPM RP):* The Radiation Portal Monitor Replacement Program (RPM RP) is a pre-ADE 3 program to identify solutions that mitigate GNDA risks resulting in a partial replacement of fixed RPM capabilities, as well as identify improved technology solutions for currently deployed fixed RPMs. A follow-on program under the RPMRP, identified as Program 1, will investigate using open systems architecture to recapitalize additional portions of the legacy RMP fleet in the future. The current RPM fleet does not support remote operations at high volume sea POEs and requires additional resources to adjudicate alarms. Additionally, there is current shortage of systems to support port expansions and reconfigurations. This project will provide 200 upgraded RPMs at CBP identified high-priority sites. The upgrades will provide reduced alarm rates, set the conditions for remote operations, improve operational efficiencies, and improve flow of commerce.

- *On Dock Rail (ODR) Program:* On Dock Rail (ODR) is a pre-ADE 3 program intended to provide increased scanning and detecting efficiencies while screening for R/N material entering the United Sates at sea ports of entry via cargo containers. Current ship to rail container offloading procedures at the Port of Los Angeles/Long Beach (TraPac), Port of Tacoma (PoT) Pierce County Terminal (PCT) (and potentially other terminals, including NY/NJ Maher Terminal Port) include placing single containers on the ground prior to transfer to rail. The containers are then scanned for R/N material by CBP officers using the mobile Radiation Portal Monitors (mRPM). This procedure unnecessarily consumes time, valuable port real estate, and CBP manpower resources, and reduces the port's flow of commerce. This project will provide stationary straddle carrier portals (SCP) that scan cargo as it is transferred directly from ship to rail.
- *International Rail (IRAIL) Program:* The International Rail (IRAIL) Program is a pre-ADE 2A program identifying and detecting R/N material entering the United States via freight rail. IRAIL supports the CBP-led Integrated Rail Inspection System (IRIS) Program by leading the radiation detection equipment (RDE) sub-system procurement as well as IRIS test and evaluation efforts. The CBP IRIS Program will re-capitalize the current fleet of aging Nonintrusive Inspection (NII) x-ray imaging equipment employed at international rail crossings. Currently, limited R/N scanning of freight rail cargo exists at rail crossings at U.S. international POEs. Existing NII technology to address these threats is approaching the end of its useful service life and is not fully capable of detecting R/N threats without the addition of passive radiation detection equipment
- *Long-Range Radiation Detection (LRRD) Program:* In FY 2016 and FY 2017, funding planned for the Long-Range Radiation Detection (LRRD) Program was reallocated to higher GNDA priorities. In FY 2018, there is no funding allocated to this program pending the completion of the development of operational requirements.
- *U.S. Border Patrol (USBP) Checkpoint Program:* In FY 2016 and FY 2017, funding planned for the U.S. Border Patrol (USBP) Checkpoint Program was reallocated to higher GNDA priorities. In FY 2018, there is no funding allocated to this program.
- *Maritime Non-Containerized Cargo (MNCC) Program*: The Maritime Non-Containerized Cargo (MNCC) Program is a pre-ADE 2A program with the objective to provide efficient and effective scanning of the most diverse cargo types -- break bulk cargo and roll-on, roll-off (vehicles, bags, bundles, crates, loose materiel, and containerized liquid) -- for R/N material entering the United States at sea POEs. When break bulk cargo is off loaded from ships, CBP officers scan it for R/N material, often using hand held devices. This capability is not suitable for the high volume of cargo being offloaded at U.S. ports and has been identified as an area for risk reduction. The MNCC program will conduct analysis to identify materiel, non-materiel, or combined, solutions that will reduce the risk of R/N material being offloaded at U.S. ports inside break bulk cargo. If not funded, the risk of off-loading R/N material will remain and resources that could be applied elsewhere will continue to remain focused on this type of threat. Combined, these possibly cause an increased risk of not detecting R/N entering at U.S. seaports.
- *Aerial Detection Program*: In FY 2016 and FY 2017, funding planned for the Aerial Detection Program was reallocated to higher priority programs due to a lack of maturity of operational requirements. In FY 2018, there is no funding allocated to this program pending the completion of operational requirements.

- *Small Vessel Standoff Detection (SVSD) Program:* The Small Vessel Standoff Detection (SVSD) Program is a pre-ADE 2A program developing and fielding for the USCG and CBP a greater capability to conduct boat-to-boat R/N detection. This program is also referred to as SVSD Increment 2. For SVSD Increment 1, a radiation detection backpack-based solution, the USCG and CBP vessel's R/N detection stand-off distance and detection frequency is limited. Furthermore, SVSD increment 1 is man packed and not integrated with the vessel structure. This physically limits USCG and CBP personnel conducting routine operations, especially during high seas, inclement weather, and when operating in a hostile environment. SVSD Increment 2 will provide the USCG and CBP increased R/N detection capability, including increased stand-off distance, detection frequency, and integration with the vessel's structure and components.
- *SIGMA:* SIGMA is a cost-effective, operationally practical, continuous city/region-scale, radiological WMD detection capability. Current Gamma and Neutron human portable WMD detectors do not feed into an automated detector network that demonstrate wide-area monitoring suitable for cities or regions. SIGMA provides low cost radiation detectors with spectroscopic gamma and neutron sensing capability, packaged as automated and networked threat detection and identification with web-based command and control at the city/region scale. SIGMA will achieve a continuous city-scale and regional WMD monitoring system with the potential to increase and refine the concept of operations previously prohibited by cost and technical capability.

FY 2016 Key Milestone Events (Prior Year)

- RPM RP: Conducted COTS systems performance evaluation and systems operational analysis based on request from industry RFI responses.
- RPM RP: Completed a cooperative research and development agreement for a vendor developed Replay Tool.
- Program 1: Constructed a table-top prototype to validate the concept of an open systems architecture replacement solution and began planning for construction of a full-scale prototype to test key features and refine technical documentation.
- ODR: Completed testing and evaluation of fixed RPMs integrated with a conveyor solution at TraPac terminal in the Port of Los Angeles/Long Beach.
- ODR: Completed Straddle Portal Prototype (SPP) upgrades and modifications, Straddle Carrier Portal (SCP) site design, and City of Tacoma permitting processes for deployment at PoT PCT.
- IRAIL: Supported CBP in the drafting of an Integrated Product Team Charter, RFI, and requirements for the IRIS, which will integrate NII imaging technology with passive radiation detection.
- SVSD Increment 1: Reached Full Operational Capability with USCG and CBP-Air and Marine Operations (AMO).

FY 2017 Planned Key Milestone Events (Year of Execution)

- HAIBP: Complete the System Threat Review (STR) and Qualitative Risk Analysis.

- Program 1: Complete construction of, test and evaluate a full-scale prototype to test key features and refine technical documentation.
- ODR: Complete SCP deployment activities, conduct SCP performance testing at Savannah River National Laboratory and operational assessment at PoT PCT.
- IRAIL: Conduct and Complete IRAIL Pathway Decomposition Study.
- MNCC: Begin initial acquisition program documentation.
- SVSD Increment 2: Complete the STR and characterization test to help inform project initiation decision.

FY 2018 Planned Key Milestone Events (Budget year)

- HAIBP: No R&D funding in FY 2018 (program will be fully funded out of Procurement, Construction, and Improvements (PCI) appropriation).
- Program 1: Prepare to release Request for Proposal.
- ODR: Develop requirements-related and program documentation for additional ODR POEs, as required.
- IRAIL: Support CBP in the completion and release of a RFP and source selection decision (to include a Capabilities Demonstration) for IRIS.
- MNCC: Conduct an STR, and AoA.
- SVSD Increment 2: If project initiated, prepare RFP, and plan to conduct test and evaluation.

Delayed Milestones

- N/A

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	$21,000	$21,400	$21,029	$20,788	$15,155
Obligations	$15,952	$12,217	$17,615	$20,788	$15,155

FY2014 and FY2015 obligation data compiled using final spend plans owing to retrieval-challenged data housed in legacy accounting system.

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2016		
3He Alternative Implementation Backpack (HAIBP) Program	Ongoing	Ongoing
Radiation Portal Monitor Replacement Program (RPM RP)	Ongoing	Ongoing
On Dock Rail (ODR) Program	Ongoing	Ongoing
International Rail (IRAIL) Program	Ongoing	Ongoing
Maritime Non-Containerized Cargo (MNCC) Program	Not Started	Not Started
Small Vessel Standoff Detection (SVSD) Program	Ongoing	Ongoing
FY 2017		
3He Alternative Implementation Backpack (HAIBP) Program	Ongoing	4TH QTR
Radiation Portal Monitor Replacement Program (RPM RP)	Ongoing	Ongoing
On Dock Rail (ODR) Program	Ongoing	Ongoing
International Rail (IRAIL) Program	Ongoing	Ongoing
Maritime Non-Containerized Cargo (MNCC) Program	1ST QTR	Ongoing
Small Vessel Standoff Detection (SVSD) Program	Ongoing	Ongoing
FY 2018		
Radiation Portal Monitor Replacement Program (RPM RP)	Ongoing	Ongoing
On Dock Rail (ODR) Program	Ongoing	Ongoing
International Rail (IRAIL) Program	Ongoing	Ongoing
Maritime Non-Containerized Cargo (MNCC) Program	Ongoing	Ongoing
Small Vessel Standoff Detection (SVSD) Program	Ongoing	Ongoing
SIGMA	1ST QTR	Ongoing

Type of Research

Developmental

Technology Readiness Level

5-7

Transition Plans

The detection capabilities under these programs will be transitioned to DHS operational component(s) (CBP, USCG, TSA, etc.) after test and evaluation to ensure they meet operational requirements, and an operational readiness review is conducted with the DHS operational component(s) deploying the capability. Post-implementation Review activities are conducted after the initial deployed units have been in operational use for 12 to 18 months to provide the necessary information to determine the degree to which a materiel investment operating in its intended environment has met the needed capability. Throughout the life of the capability, DNDO works collaboratively with the DHS operational components to manage the equipment configuration to ensure it continues to meets its operational requirements; as well as collect and analyze operational performance and maintenance data to maximize performance per maintenance dollar, and inform future procurement requirements.

Detection Capability Assessments –PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Detection Capability Assessments	-	-	$39,503	-	-	$39,051	-	-	$34,127	-	-	($4,924)
Total	**-**	**-**	**$39,503**	**-**	**-**	**$39,051**	**-**	**-**	**$34,127**	**-**	**-**	**($4,924)**
Subtotal Discretionary - Appropriation	-	-	$39,503	-	-	$39,051	-	-	$34,127	-	-	($4,924)

Detection Capability Assessment – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$39,503		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$39,503**	**$39,051**	**$34,127**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$9,565	$7,508	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$49,068**	**$46,559**	**$34,127**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$49,068**	**$46,559**	**$34,127**
Obligations (Actual/Projections/Estimates)	$37,561	$46,559	$34,127
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Detection Capability Assessment – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$39,503**
FY 2016 Revised Enacted	**-**	**-**	**$39,503**
FY 2017 Annualized CR	**-**	**-**	**$39,051**
FY 2018 Base Budget	**-**	**-**	**$39,051**
Transfer to O&S Mission Support due to CAS Realignment	-	-	($3,474)
Total Transfers	**-**	**-**	**($3,474)**
Total Adjustments-to-Base	**-**	**-**	**($3,474)**
FY 2018 Current Services	**-**	**-**	**$35,577**
Detection Capability Assessments	-	-	($1,450)
Total, Program Decreases	**-**	**-**	**($1,450)**
FY 2018 Request	**-**	**-**	**$34,127**
FY 2017 TO FY 2018 Change	**-**	**-**	**($4,924)**

PPA Description

The Detection Capability Assessment PPA, supports the development and acquisition process for mission-related technologies. DNDO continually assesses the GNDA and implemented capabilities through a variety of means, including test and evaluation (T&E) campaigns to characterize and collect performance data on commercially available and emerging technologies and systems.

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 R/N detection systems.

Adjustments to Base Justification

DNDO continues to examine and mature its implementation of the Common Appropriation Structure. As part of a review of program

alignment, funds for information technology governance, infrastructure and cybersecurity were transferred from the Detection Capability Assessment PPA in Research and Development to the Mission Support PPA in Operations and Support. Some information technology infrastructure capabilities have matured beyond development and DNDO considers these activities best aligned to Operations and Support. The funding transferred supports preparation of agreements to effectively share radiological/nuclear (R/N) detection information among FSLTT partners, in order to prevent terrorism and enhance national security; and validates cybersecurity compliance and readiness of DNDO systems and safeguarding of DNDO sensitive information in third-party systems and services. The funding supports the evolution of technical competencies and expertise as well as tools and technologies which comprise DNDO's adaptive mission-support information technology infrastructure.

Detection Capability Assessment – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Detection Capability Assessments	$39,503	$39,051	$34,127	($4,924)
Total	**$39,503**	**$39,051**	**$34,127**	**($4,924)**
Discretionary - Appropriation	$39,503	$39,051	$34,127	($4,924)

Detection Capability Assessment – PPA
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$154	$152	$382	$230
25.1 Advisory and Assistance Services	$7,256	$7,173	$14,173	$7,000
25.3 Other Goods and Services from Federal Sources	$26,259	$25,959	$19,572	($6,387)
25.5 Research and Development Contracts	$5,834	$5,767	-	($5,767)
Total - Non Pay Object Classes	**$39,503**	**$39,051**	**$34,127**	**($4,924)**

Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Operational Readiness Assessment	$8,386	$8,724	$9,868	$1,144
Studies & Infrastructure	$10,009	$8,977	$0	($8,977)
Test & Evaluation Program	$17,749	$17,876	$24,259	$6,383
Information Sharing	$3,359	$3,474	$0	($3,474)
Total – Non Pay Cost Drivers	**$39,503**	**$39,051**	**$34,127**	**($4,924)**

NARRATIVE EXPLANATION OF CHANGES

DNDO balanced program requirements while supporting the FY 2018 President's Budget. For explanation of program changes, see Justification of Program Changes. Funding for the Information Sharing program transferred to the Mission Support PPA in the Operations and Support appropriation.

Detection Capability Assessment – PPA
Research and Development
Technology Readiness Level Exhibit

Project Description:
The DNDO 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 the Test, Evaluation, and Analysis Program (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). DNDO utilizes a suite of test instrumentation and automated data collection systems to enable testing teams to rapidly verify and validate data. The Standards project follows a cycle of development, use, and revision of consensus and technical capability standards to ensure that each standard remains effective for the assessment of R/N detection technology.

- **Problem:** Support DNDO's focus on preventing nuclear terrorism by assuring that detection equipment and systems meet specific requirements and standards.
- **Solution:** Plan and execute tests and evaluations to provide critical information on the technical and operational capabilities and limitations of our detection technologies, acquisition decisions, and facilitate the development of standards and requirements.
- **Impact:** These tests and evaluations provide critical information on detection technologies used to prevent nuclear terrorism.

Sub Projects
- *T&E Operations:* The Sub-Project funds the staff resources necessary to independently plan test activities, ensure scientific defensibility and rigor, oversee test execution, and report results.
- *Operational Analysis and Technical Assessments (OATA):* The OATA Sub-Project provides the subject matter experts that conduct technical assessments. The activities and products produced from this effort will transform data collected during assessments into actionable knowledge of R/N detectors under acquisition consideration. 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. (Data Mining Analysis and Modeling and Simulation Cell).
- *Directed Test:* Through the Directed Test Sub-Project, DNDO conducts test campaigns using mature, commercially available R/N detection systems in operational scenarios faced by FSLTT end-users. These Directed Tests produce independent assessments of equipment to confirm vendor performance claims and can help with development and/or refinement of the end-users' CONOPS and can help identify training needs.

- *Standards and Conformity Testing:* The Sub-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 an R/N detection system conforms to specified standards. Such conformity assessments require testing facilities that can reliably test equipment against the standards
- *Sources and Infrastructure:* The Sub-Project provides oversight for the R/N Countermeasures Test and Evaluation Center (RNCTEC) test venue and the design, fabrication and management of radiation signature training devices (RSTD) and radioactive sources to support the Test and Evaluation Program.

FY 2016 Key Milestone Events (Prior Year)

- Supported national and international consensus standards and technical capability standards
  - Commenced interagency coordination of two technical capability standards (TCS).
  - Supported publication of a revision to the voluntary consensus standard ANSI N42.35.
  - Conducted a conformity test campaign for mobile radiation detection systems against the *Vehicle Mounted Mobile Systems TCS*.
- Delivered five RSTDs; began fabrication and defined requirements for additional RSTDs.
- Began the IT upgrades and established additional source shipment and handling capability at RNCTEC.
- Provided T&E staff resources and expertise to support the planning of nine developmental and/or operationally relevant test campaigns addressing next-generation Radiation Portal Monitors, systems development testing, and commercial systems testing;
  - Executed and provided reports for five of the nine test events planned in FY 2016.
  - Commenced planning for five FY 2017 developmental and/or operationally relevant test campaigns.
- Completed the systems requirements document for a central repository platform for housing T&E data and related information for the Radiological and Nuclear Data Repository (RNDR).
- Fully upgraded the Report Analysis and Archive System (RAAS) to a new architecture that will facilitate complex searches, improved document retrieval, analysis, and interconnections with other DNDO funded repositories, and added an additional 131 documents this year, increasing the total documents in RAAS to 1,139.
- Expanded the data catalog system to 154 users representing 19 organizations; expanded the Instrument Library to 36 fielded instruments; expanded the Modeling Catalog (ModCat) to 37 models and analysis packages; expanded the Background Catalog to over 60 verified radiation backgrounds submitted from multiple organizations.
- Completed development of the Data Mining, Analysis and Modeling Cell (DMAMC) to full deployment and sustainment. Responded to 51 major technical and scientific requests for information and analysis from a variety of internal and external stakeholders. Developed and exercised a crisis response capability within the DMAMC to respond to emergency requests for information during the National Level Exercise Capstone. Finalized and standardized normalization procedures to ensure re-

usability of data.
- Created domestic and international partnerships to expand the Replicative Assessment of Spectrometric Equipment (RASE) database and enhance the capability for dynamic systems such as portals.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Publish *Aerial Radiation Detection Systems TCS*, conduct interagency coordination on two TCSs, and support publication of a revision *ANSI N42.37*.
- Conduct a conformity test campaign against the *Aerial Radiation Detection Systems TCS*.
- Complete IT upgrades at RNCTEC.
- Begin RSTD fabrication; deliver additional RSTDs.
- Plan, execute, and/or provide reports for at least nine developmental or operational test campaigns.
- Plan the Robotics R/N Detection Directed Test.
- Continue building interconnections between RAAS and the DMAMC Lexicon, Modeling Catalog, and Instruments Catalog and add ability to search and filter uploaded documents and improve aggregate views of data.
- Include DHS Science and Technology consequence management instrument database into the Instrument Library, and expand the number of models incorporated into the ModCat and Background Catalogs.
- Continue domestic and international partnership to further expand the RASE database and enhance the capability for dynamic systems such as portals.
- Sustain DMAMC capability and continue to dynamically populate the compendium of data. Respond to 100 major technical and scientific requests for information and analysis.
- Build two radiological source kits to support normalization testing.
- Begin development of summary reports for all RDE technology categories currently deployed in MDDUs.
- Develop a framework to establish and maintain the DMAMC SME network. Continue integration of Design of Experiment in DNDO T&E campaigns.

FY 2018 Planned Key Milestone Events (Budget year)

- Publish the *Active Interrogation TCS*, complete the interagency coordination on two TCSs, and support the revision of the *ANSI N42.48*.
- Conduct a conformity test campaign for a class of R/N detection equipment against the applicable TCS.
- Deliver two RSTDs.
- Begin excessing of obsolete testing equipment at RNCTEC.
- Plan, execute, and/or provide reports for at least nine developmental or operational test campaigns.
- Plan and execute the Robotics R/N Detection Directed Test.

- Continue building interconnections between RAAS and the DMAMC Lexicon, Modeling Catalog and Instruments Catalog and add ability to search and filter uploaded documents and improve aggregate views of data.
    - Continue development of the RNDR in FY 2018 to illuminate areas that yield opportunities for T&E process improvements and efficiencies.
    - Sustain DMAMC capability and deploy initial crisis response capability. Respond to 100 major technical and scientific requests for information and analysis. Complete development of summary reports for all RDE technology categories currently deployed in the MDDU. Deploy the DMAMC SME network management system.
    - Begin Central Data Repository integration with RAAS and other DMAMC catalogs.

Delayed Milestones

- N/A

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	$18,546	$16,254	$26,828	$26,330	$24,259
Obligations	$18,546	$16,254	$21,435	$26,330	$24,259

FY2014 and FY2015 obligation data compiled using final spend plans owing to retrieval-challenged data housed in legacy accounting system.

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2016		
Delivered five RSTDs; began fabrication and defined requirements for additional RSTDs.	1st QTR	4th QTR
Began the IT upgrades and establish additional source shipment and handling capability at RNCTEC.	4th QTR	4th QTR
Planned the COTS Vehicle-Mounted Mobile Systems "Honey Badger" Directed Test (Phase 1) in support of Federal, state, local and tribal partners	1st QTR	4th QTR
Performed On-Dock Rail (ODR) Data Collection	2nd QTR	2nd QTR
Conducted a conformity test campaign for mobile radiation detection systems against the Vehicle Mounted Mobile Systems TCS	2nd QTR	3rd QTR

Research & Development Description	Planned Start Date	Planned Completion
FY 2017		
Complete IT upgrades at RNCTEC.	1st QTR	4th QTR
Begin RSTD fabrication; deliver additional RSTDs.	1st QTR	4th QTR
Execute the COTS Vehicle-Mounted Mobile Systems "Honey Badger" Directed Test (Phase 1) in support of Federal, state, local and tribal partners	1st QTR	1st QTR
Plan the Robotics R/N Detection Directed Test	3rd QTR	4th QTR
Perform ODR SCP Performance Test	1st QTR	1st QTR
Publish Aerial Radiation Detection Systems TCS	1st QTR	4th QTR
FY 2018		
Deliver two RSTDs.	1st QTR	4th QTR
Excess obsolete testing infrastructure at RNCTEC	1st QTR	4th QTR
Plan and execute the Robotics R/N Detection Directed Test	1st QTR	2nd QTR
Publish the Active Interrogation TCS	1st QTR	4th QTR
Plan, execute, and/or provide reports for at least nine developmental or operational test campaigns	1st QTR	4th QTR

Type of Research

Not Applicable

Technology Readiness Level

Not Applicable

Transition Plans

Not Applicable

Project Description:

The Operational Readiness Assessment (ORA) Program is DNDO's primary means to objectively assess the operational effectiveness and performance of the DNDO programs and deployed R/N detection capabilities at the FSLTT levels in support of the GNDA. ORA program also assesses the effectiveness of planned and deployed elements of the GNDA and supporting programs.

- **Problem:** Objectively assess the operational effectiveness and performance of the DNDO programs and deployed R/N detection capabilities at the FSLTT levels in order to improve the GNDA.
- **Solution:** Evaluate deployed systems and operations and their associated tactics, techniques and procedures, in as-close-to-realistic environments as possible and perform objective reviews of the effectiveness of GNDA programs and their associated activities.
- **Impact:** These assessments are conducted to provide objective findings and recommendations to improve the GNDA.

Sub Projects

- *Program Assessments (PA):* 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.
- *Red Team (RT):* 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 R/N detection and interdiction operations. These presentations can either be covert or overt in nature.

FY 2016 Key Milestone Events (Prior Year)

- Conducted 36 overt and covert operations and adversarial-based assessments of the GNDA.
- Conducted an assessment of DNDO's Radiological and Nuclear Situational Awareness Efforts and their Analytic Processes and initiated two others: GNDA Performance Measures Assessment and DNDO State and Local Detection Capability Sustainment.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Conduct at least 20 overt and covert operations and adversarial-based assessments of the GNDA.
- Initiate/complete at least three program assessments and perform other assessments as required.

FY 2018 Planned Key Milestone Events (Budget year)

- Conduct at least 20 overt and covert operations and adversarial-based assessments of the GNDA.
- Initiate/complete at least three program assessments and perform other assessments as required.

Delayed Milestones

- N/A

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	$9,681	$10,110	$12,675	$12,721	$9,868
Obligations	$9,681	$10,110	$10,256	$12,721	$9,868

FY2014 and FY2015 obligation data compiled using final spend plans owing to retrieval-challenged data housed in legacy accounting system.

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2016		
Program Assessments	1st QTR	4th QTR
Red Team	1st QTR	4th QTR
FY 2017		
Program Assessments	1st QTR	4th QTR
Red Team	1st QTR	4th QTR
FY 2018		
Program Assessments	1st QTR	4th QTR
Red Team	1st QTR	4th QTR

Type of Research

Not Applicable

Technology Readiness Level

Not Applicable

Transition Plans

Not Applicable

Nuclear Forensics –PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Nuclear Forensics	-	-	$19,031	-	-	$18,813	-	-	$18,361	-	-	($452)
Total	**-**	**-**	**$19,031**	**-**	**-**	**$18,813**	**-**	**-**	**$18,361**	**-**	**-**	**($452)**
Subtotal Discretionary - Appropriation	-	-	$19,031	-	-	$18,813	-	-	$18,361	-	-	($452)

Nuclear Forensics – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$19,031		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$19,031**	**$18,813**	**$18,361**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$1,546	$1,766	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$20,577**	**$20,579**	**$18,361**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$20,577**	**$20,579**	**$18,361**
Obligations (Actual/Projections/Estimates)	$19,012	$20,579	$18,361
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Nuclear Forensics – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$19,031**
FY 2016 Revised Enacted	**-**	**-**	**$19,031**
FY 2017 Annualized CR	**-**	**-**	**$18,813**
FY 2018 Base Budget	**-**	**-**	**$18,813**
FY 2018 Current Services	**-**	**-**	**$18,813**
Nuclear Forensics	-	-	($452)
Total, Program Decreases	**-**	**-**	**($452)**
FY 2018 Request	**-**	**-**	**$18,361**
FY 2017 TO FY 2018 Change	**-**	**-**	**($452)**

PPA Description

The Nuclear Forensics PPA advances the science of nuclear forensics - the examination of materials recovered from R/N 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;[2] enable the identification and closure of illicit R/N trafficking networks; promote nuclear security; and deter potential adversaries by increasing their perceived and actual risk of failure and the prospect of being held accountable for planned or attempted attacks. This PPA includes the National Technical Nuclear Forensics Center (NTNFC), which through its operational readiness, technology advancement, and expertise development missions, provides centralized planning, integration and advancement of USG nuclear forensics capabilities while leading the interagency implementation of the *National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States*.

The Nuclear Forensics Program is organized into three mission areas: Operational Readiness, Technology Advancement, and Expertise Development.

[2] 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.

DNDO 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*.

Adjustments to Base Justification

Not Applicable

Nuclear Forensics – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Nuclear Forensics	$19,031	$18,813	$18,361	($452)
Total	**$19,031**	**$18,813**	**$18,361**	**($452)**
Discretionary - Appropriation	$19,031	$18,813	$18,361	($452)

Nuclear Forensics – PPA
Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$60	$110	$110	-
25.1 Advisory and Assistance Services	$2,784	$2,629	$2,563	($66)
25.3 Other Goods and Services from Federal Sources	$12,269	$13,013	$13,219	$206
25.5 Research and Development Contracts	$1,975	$2,441	$1,819	($622)
41.0 Grants, Subsidies, and Contributions	$1,943	$620	$650	$30
Total - Non Pay Object Classes	**$19,031**	**$18,813**	**$18,361**	**($452)**

Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Operational Readiness	$4,317	$3,727	$3,970	$243
Technology Advancement	$9,851	$9,858	$9,152	($706)
Expertise Development	$4,863	$5,228	$5,239	$11
Total – Non Pay Cost Drivers	**$19,031**	**$18,813**	**$18,361**	**($452)**

NARRATIVE EXPLANATION OF CHANGES

DNDO balanced program requirements while supporting the FY 2018 President's Budget. For explanation of program changes, see Justification of Program Changes.

Nuclear Forensics – PPA
Research and Development
Technology Readiness Level Exhibit

Project Description:

Through the Operational Readiness Project, DNDO, as the USG National Technical Nuclear Forensics (NTNF) program integrator, 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. DNDO leads the development of foundational planning documents that establish interagency strategic goals, objectives, requirements, processes, plans, and operational procedures for the NTNF mission. DNDO sponsors and leads assessments to evaluate these efforts and improve the Nuclear Forensics capability across the mission spectrum from pre- to post-detonation, both within the United States and abroad. DNDO also coordinates partner agency programs to facilitate alignment and eliminate duplication. Another key component of ensuring operational readiness, as emphasized by the National Academy of Sciences in a 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, 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 DNDO and its partners to identify corrective actions based on after-action reports and lessons learned.

- **Problem:** The need to maintain and advance the operational readiness of the USG technical nuclear forensics capabilities.
- **Solution:** Coordination and integration of nuclear forensics activities for the USG, including interagency program planning from the strategic to tactical level, continual evaluation of the technical nuclear forensics capability through assessments and analyses, increasingly rigorous and realistic exercises, and promoting international collaboration to advance global nuclear forensics capabilities.
- **Impact:** A ready, robust, and enduring technical nuclear forensics capability.

Sub Projects

- *Assessments and Analysis:* The Assessments and Analysis Sub Project strengthens nuclear forensics capability through regular evaluations and assesses processes and capabilities to ensure readiness and to identify lessons learned, best practices, 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 radiochemistry, statistics, nuclear production processes, and modeling and simulation of nuclear processes. At the request of the DNDO and interagency partners, the NFSP assesses various aspects of

NTNF and answers technical questions that may guide future operational or R&D activities.

- *Centralized Planning:* The Centralized Planning Sub 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 in order to address priority needs and ensure unity of effort. DNDO accomplishes this integration through its leadership of the Nuclear Forensics Executive Council, NTNF Steering Committee, and issue-specific working groups.
- *Exercises:* The Exercises Sub Project strengthens nuclear forensics capability through jointly planned and executed exercises across the entire nuclear forensics mission space and that are inclusive of all partner agencies. Well-documented lessons learned and a robust corrective actions program play a significant role in improving the collective nuclear forensics capabilities and future exercise planning and execution. This includes the conduct of rigorous full-scale interagency exercises to rehearse, evaluate, identify gaps, and improve the nuclear forensics capabilities.
- *International Engagements*: The International Engagements Sub 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. DNDO activity in this area involves subject-matter expert contributions to multilateral initiatives and organizations, such as the Nuclear Security Summits, GICNT, IAEA, and the Nuclear Forensics International Technical Working Group (ITWG), to develop key technical and policy-oriented guidance documents. Bilateral work features direct collaboration between DNDO and foreign governments on pre-detonation nuclear forensics and related technical projects. These activities are prioritized based on the DNDO's R&D interests and the concurrent benefits of building relationships and strengthening partner nations' capabilities.

FY 2016 Key Milestone Events (Prior Year)

- Enhanced interagency coordination through leadership of the NTNF Steering Committee, Executive Council, and issue-specific working group, and led the development of the *Joint Interagency Annual Review of the National Strategic Five-Year Plan* and the annual update of the NTNF Budget Crosscut.
- Led agencies from across the CBRN mission space to consensus on an interagency framework for conducting weapons of mass destruction (WMD) attribution. The WMD Attribution Framework (WAF) outlines the USG process for providing timely, authoritative assessments to appropriate U.S. officials regarding the nature, source, perpetrator, and pathway of an attempted or actual WMD attack.
- Provided subject-matter expertise to major multilateral nuclear forensics forums, to include the IAEA, GICNT, Nuclear Forensics ITWG, and the 2016 NSS.
- Advanced nuclear forensics bilateral engagements with Sweden, the United Kingdom, and Canada, to include: advancing ongoing joint R&D work through a U.S.-Sweden Technical Annex under the "Project Arrangement on Cooperation and

Information Exchange in Radiological and Nuclear Forensics" (2013); discussing current and future cooperation with the United Kingdom (UK) Ministry of Defense and Atomic Weapons Establishment during the annual Joint Working Group 29 Nuclear Forensics User Group meeting; and collaborating with Canadian colleagues on certified reference material development and characterization.
- Coordinated the planning and execution of one pre-detonation materials exercise, one pre-detonation device exercise, and two post-detonation collections exercises.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Lead the development of the *Joint Interagency Annual Review* of the *National Strategic Five-Year Plan* and the annual update of the *NTNF Budget Crosscut*. Continue to enhance interagency coordination through leadership of the NTNF Steering Committee, Executive Council, and issue-specific working groups.
- Continue to advance international nuclear forensics efforts through participating in and contributing to activities of the key multilateral nuclear forensics initiatives, including the GICNT, IAEA, and ITWG, as well as bilateral work with the UK, Sweden, and Canada.
- Coordinate the planning and execution of one pre-detonation materials exercise, one pre-detonation device exercise and two post-detonation collections exercises.
- Assist in the development of an interagency WAF Implementation Plan, in close coordination with interagency partners.

FY 2018 Planned Key Milestone Events (Budget year)

- Lead the development of the Joint Interagency Annual Review of the National Strategic Five-Year Plan and the annual update of the NTNF Budget Crosscut. Continue to enhance interagency coordination through leadership of the NTNF Steering Committee, Executive Council, and issue-specific working groups.
- Continue to advance international nuclear forensics efforts through participating in and contributing to activities of the key multilateral nuclear forensics initiatives, to include the GICNT, IAEA, and ITWG, and bilateral collaborations with partner nations.
- Support the development and execution of an interagency tabletop exercise (or series of exercises), in close coordination with NTNF partners, to test the newly codified WAF, WAF Implementation Plan, and associated processes.
- Coordinate the planning and execution of one pre-detonation materials exercise, one pre-detonation device exercise and two post-detonation collections exercises.

Delayed Milestones

- N/A

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	$3,187	$2,830	$4,317	$3,727	$3,970
Obligations	$3,187	$2,505	$4,015	$3,727	$3,970

FY2014 and FY2015 obligation data compiled using final spend plans owing to retrieval-challenged data housed in legacy accounting system.

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2016		
Interagency coordination	1st QTR	Ongoing
International Engagements (bilateral and multilateral initiatives)	1st QTR	Ongoing
Coordinate/plan pre/post-detonation exercise	1st QTR	4th QTR
FY 2017		
Interagency coordination	1st QTR	Ongoing
International Engagements (bilateral and multilateral initiatives)	1st QTR	Ongoing
Coordinate/plan pre/post-detonation exercise	1st QTR	4th QTR
FY 2018		
Interagency coordination	1st QTR	Ongoing
International Engagements (bilateral and multilateral initiatives)	1st QTR	Ongoing
Coordinate/plan pre/post-detonation exercise	1st QTR	4th QTR

Type of Research

Operational readiness supports technology development by exercising operational capabilities and assists in identifying gaps for future development efforts. Operational readiness also supports operational testing of technologies under development to ensure technologies can perform under operational conditions.

Technology Readiness Level

Levels 5-7

Transition Plans

Technologies developed will be operationally tested under realistic conditions resulting in stakeholder buy-in and adoption by operational community.

DNDO's Nuclear Forensics R&D efforts are informed by high level policy guidance, legislation, and pre-eminent scientific expertise, included in National Security/Homeland Security Policy Directives, the *Joint Interagency Annual Review* of the President's *National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the U.S.*, the 2010 *Nuclear Forensics and Attribution Act*, and the 2010 National Academy of Sciences Report, *Nuclear Forensics: A Capability at Risk*. Our R&D efforts support our operational partners' needs and capabilities, help maintain a viable workforce, and focus the efforts of our students and universities, all of which is connected to a strong exercise program.

Project Description:

DNDO, through the Technology Advancement Project, 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 uncertainties and develops signatures and data evaluation tools to support attribution assessments. In addressing the pre-detonation materials forensics capability development mission, the Technology Advancement Project provides advanced operational capability to the Bulk Special Nuclear Material Analysis Program (BSAP). BSAP is an interagency program coordinated by the National Nuclear Security Administration Office of Technical Nuclear Forensics (Department of Energy (DOE) NA-83). It is the program that operates the Nuclear Forensics analytical capability for interdicted nuclear materials. The Federal Bureau of Investigation (FBI), the DOE Office of Intelligence and Counterintelligence (DOE-IN), and DHS are participants in the program. The methods and signatures are provided to operators in the FBI, Department of Defense (DoD), DOE, and intelligence community.

- **Problem:** There is a need to assess, identify, develop, demonstrate, and operationalize scientific and technological approaches that address gaps in the *National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States FY 2015 - 2019* and to continuously improve the speed, quality, and confidence of pre-detonation bulk material nuclear forensics methodologies.
- **Solution:** The Technology Advancement program explores innovative, low-risk, later-stage technologies and methodologies. Specifically, the Technology Advancement program develops technologies and methodologies that:
  - Address capability gaps and weaknesses found in the *National Strategic Five-Year Plan for Improving the Nuclear Forensics and Attribution Capabilities of the United States FY 2015 - 2019*;
  - Assesses current forensics laboratory performance, identifies improvement areas, develops methodologies, and fields solutions to enhance operational nuclear forensics capabilities; and
  - Develops pre-detonation material nuclear forensics signatures to determine material and statistical population characteristics that can uniquely identify linkages with known or predicted material characteristics.
- **Impact:** Capabilities developed under the Technology Advancement program continuously improve the USG pre-detonation materials nuclear forensics operational capability. In addition, Technology Advancement efforts support development of the next generation of nuclear forensic scientific expertise.

Sub Projects

- *Reference Material Development:* 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.

- *Plutonium Processing Signatures:* 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.
- *Uranium Processing Signatures:* The Uranium Processing Signatures Project continues to operate and improve 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.
- *Material Characterization:* 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 are 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:* The Methodology Benchmarking Project evaluates and benchmarks laboratory capabilities to perform specific analytical methods. This project identifies (1) the most accurate, precise, and timely methods available and appropriate for operational use, and (2) gaps for which improved methods are needed and that will be developed under the New Methodology Development Project. Improved methods are then transitioned to the operational laboratories through a technology transfer workshop.
- *Data Evaluation Tools:* The Data Evaluation Tools Project develops and demonstrates the next generation of tools for data pattern analysis and methods to assess whether or not measurements from samples can be linked and included or excluded from specific families of signatures.
- *New Methodology Development:* The New Methodology Development Project advances the accuracy, precision, and timeliness of measurement techniques. This project focuses on activities at TRLs 5-8, while Transformational and Applied R&D in the Exploratory Research Program addresses efforts at TRLs 2-5.
- *New Signature Development:* The New Signature Development Project determines material and statistical population characteristics that can uniquely identify linkages with known or predicted material characteristics. This project focuses on activities at TRLs 5-8, while Transformational and Applied R&D in the Exploratory Research Program addresses efforts at TRLs 2-5.

FY 2016 Key Milestone Events (Prior Year)

- Produced two certified reference materials for forensic method improvement and quality assurance purposes.
- Fully characterized four nuclear forensic relevant samples to assist in populating the U.S. National Nuclear Forensics Library and to maintain a sharp operational nuclear forensics workforce.
- 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.
- Continued transition to operational use an improved methodology for characterization of trace elements in uranium.
- Completed benchmarking study for improving measurements of trace actinides in plutonium and began transition to operational use.

FY 2017 Planned Key Milestone Events (Year of Execution)

- 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 an improved methodology for characterization of trace elements in uranium.
- Commence transition to operational use an improved methodology for characterization of trace elements in plutonium.
- Commence benchmarking study for improving measurements of trace elements in uranium.

FY 2018 Planned Key Milestone Events (Budget year)

- 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 an improved methodology for characterization of trace elements in plutonium and uranium.
- Continue benchmarking study for improving measurements of trace elements in uranium.

Delayed Milestones

- N/A

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	$11,174	$9,968	$9,851	$9,858	$9,152
Obligations	$11,174	$9,934	$9,673	$9,858	$9,152

FY2014 and FY2015 obligation data compiled using final spend plans owing to retrieval-challenged data housed in legacy accounting system.

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2016		
New/Improved Methodology Development	1st QTR	Ongoing
Nuclear Forensic Certified Reference Material Production	1st QTR	Ongoing
Radiological & Nuclear Material Characterizations	1st QTR	Ongoing
Methodology Benchmarking Study	1st QTR	Ongoing
Stable & Radioisotope Mass Separators	1st QTR	Ongoing
Radiological Sealed Source Library	1st QTR	Ongoing
Plutonium and Uranium Signature Development	1st QTR	Ongoing
Data Evaluation Tools	1st QTR	Ongoing
FY 2017		
New/Improved Methodology Development	1st QTR	Ongoing
Nuclear Forensic Certified Reference Material Production	1st QTR	Ongoing
Radiological & Nuclear Material Characterizations	1st QTR	Ongoing
Methodology Benchmarking Study	1st QTR	Ongoing
Stable & Radioisotope Mass Separators	1st QTR	Ongoing
Radiological Sealed Source Library	1st QTR	Ongoing
Plutonium and Uranium Signature Development	1st QTR	Ongoing
Data Evaluation Tools	1st QTR	Ongoing

Research & Development Description	Planned Start Date	Planned Completion
FY 2018		
New/Improved Methodology Development	1st QTR	Ongoing
Nuclear Forensic Certified Reference Material Production	1st QTR	Ongoing
Radiological & Nuclear Material Characterizations	1st QTR	Ongoing
Methodology Benchmarking Study	1st QTR	Ongoing
Stable & Radioisotope Mass Separators	1st QTR	Ongoing
Radiological Sealed Source Library	1st QTR	Ongoing
Plutonium and Uranium Signature Development	1st QTR	Ongoing
Data Evaluation Tools	1st QTR	Ongoing

Type of Research

Developmental:

Reference Material Development, Material Characterization, Methodology Benchmarking, Plutonium Processing Signatures, Uranium Processing Signatures

Applied:

New Signature Development, New Methodology Development, Data Evaluation Tools

Technology Readiness Level

Levels 5-7

Transition Plans

Successful Technology Advancement methodologies and concepts transition to operational customers through the Bulk Special Nuclear Material (SNM) Analysis Program.

Project Description:

As mandated by the *Nuclear Forensics and Attribution Act, 2010 (P.L. 111-140)*, the National Nuclear Forensics Expertise Development Program (NNFEDP), as well as the Federal Expertise Development Program (FEDP) which resides within, are the comprehensive USG effort to address the enduring challenge of sustaining a preeminent workforce of scientists and policymakers 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. FEDP enhances the education of the federal workforce in areas critical to technical nuclear forensics, facilitates technical and professional development, and promotes understanding of partner department and agency missions. These programs are led by DNDO in close collaboration with the Departments of Defense, Energy, and Justice (Federal Bureau of Investigation), through a biannual Expertise Development Committee.

- **Problem:** Current TNF activities leverage significantly off the shrinking nuclear weapons complex which has been in decline since the end of the Cold War with nuclear scientists leaving the field for other pursuits. The majority of nuclear scientists remaining are retired or nearing retirement. Additionally, compounding the issue, the number of students entering into the academic pipeline in nuclear forensics-related degree programs has declined significantly since the 1970s.
- **Solution:** Provide long-term and continued investment to promote education and training within academia, the national and defense laboratories that perform nuclear forensics research, and the federal workforce. Bolster the existing workforce through providing technical and policy training and education opportunities for senior and junior scientists as well as federal personnel.
- **Impact**: An enduring nuclear forensics workforce which is able to meet technical and policy mission requirements.

Sub Projects

- *Academics:* The Academics Sub Project supports a current DHS management performance measure for DNDO. 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 an undergraduate summer school, graduate fellowships and internships, and collaborative national laboratory and university R&D support.
- *Assessments Project:* The Assessments Sub Project evaluates the state of the workforce within the national and defense laboratory system, relative to USG NTNF mission requirements, in order to appropriately scale and scope the NNFEDP into future years.
- *Laboratories Project:* The Laboratories Sub Project supports post-doctorate fellowships and early-career awards at the national laboratories as well as planned outreach and recruitment activities to potential university and student participants. Additionally, the Laboratories Project supports development and presentation of curricula related to nuclear forensics training for the Federal workforce.

FY 2016 Key Milestone Events (Prior Year)

- Supported 10 Seaborg Institute nuclear science summer interns, five undergraduate scholars, one undergraduate summer school, 16 graduate fellows, 17 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.
- Enhanced university and student engagement in nuclear forensics-related R&D through a dedicated outreach strategy.
- Sponsored two nuclear forensics courses as part of the "Overview of Nuclear Forensics for the Federal Workforce" at Oak Ridge National Laboratory, and "Nuclear Testing, Diagnostics, Forensics, and Stockpile Stewardship" at Lawrence Livermore National Laboratory and the Nevada National Security Site.
- Evaluated the state of the nuclear forensics workforce within the DOE national laboratories to inform and guide expertise development program efforts.

FY 2017 Planned Key Milestone Events (Year of Execution)

- Implement three 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; one undergraduate summer school; two research awards; 12 graduate fellowships; 14 post-doctorate fellowship positions; one early career award; and dedicated one-on-one senior scientist/student mentoring at the national laboratories.
- Continue to enhance university and student engagement in nuclear forensics-related R&D through a dedicated outreach strategy.
- Sponsor one nuclear forensics course for the Federal workforce: "Nuclear Testing, Diagnostics, Forensics, and Stockpile Stewardship."

FY 2018 Planned Key Milestone Events (Budget year)

- Support 7 Seaborg Institute nuclear science summer interns; one undergraduate summer school; three research awards; four graduate fellowships; 14 post-doctorate fellowship positions; and one early-career award.
- Evaluate the state of the nuclear forensics workforce within the national and defense laboratories to inform and guide expertise development program efforts.
- Continue to enhance university and student engagement in nuclear forensics-related R&D through a dedicated outreach strategy.
- Sponsor two nuclear forensics courses for the Federal workforce: "Overview of Nuclear Forensics for the Federal Workforce" and "Nuclear Testing, Diagnostics, Forensics, and Stockpile Stewardship."

Delayed Milestones

- N/A

Overall Project Funding

	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
Project Funding	$5,477	$5,383	$4,863	$5,228	$5,239
Obligations	$5,477	$5,383	$4,563	$5,228	$5,239

Project Schedule

Research & Development Description	Planned Start Date	Planned Completion
FY 2016		
Glen T. Seaborg Nuclear Science Summer Internship	1st QTR	Ongoing
Post-Doctoral Fellowships	1st QTR	Ongoing
Nuclear Forensics Junior Faculty Award Program	1st QTR	4th QTR
Nuclear Forensics Education Award Program	1st QTR	4th QTR
Nuclear Forensics Undergraduate Scholarship and Internship Program	1st QTR	4th QTR
Federal Expertise Development Courses	1st QTR	Ongoing
FY 2017		
Glen T. Seaborg Nuclear Science Summer Internship	1st QTR	Ongoing
Nuclear Forensics Undergraduate Summer School	1st QTR	Ongoing
Post-Doctoral Fellowships	1st QTR	Ongoing
Early Career Award	1st QTR	Ongoing
Nuclear Forensics Research Awards	1st QTR	Ongoing
Federal Expertise Development Courses	1st QTR	Ongoing
FY 2018		
Glen T. Seaborg Nuclear Science Summer Internship	1st QTR	Ongoing

Research & Development Description	Planned Start Date	Planned Completion
Nuclear Forensics Undergraduate Summer School	1st QTR	Ongoing
Post-Doctoral Fellowships	1st QTR	Ongoing
Early Career Award	1st QTR	Ongoing
Nuclear Forensics Research Awards	1st QTR	Ongoing
Federal Expertise Development Courses	1st QTR	Ongoing

Type of Research

Basic, Applied, Developmental

Technology Readiness Level

TRL 1-7

Transition Plans

NNFEDP transition plans revolve around on the ability to transition people, from academia to the national laboratories or federal agencies, and knowledge, from senior scientists and policymakers to junior workforce staff. Any research performed within the NNFEDP is at the direction of other federal research programs which are responsible for transitioning the research from TRL 1-3 into an operational method or tool.

Department of Homeland Security

Domestic Nuclear Detection Office

Federal Assistance

Fiscal Year 2018
Congressional Justification

Table of Contents

Federal Assistance

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Federal, State, Local, Territorial, and Tribal Support	-	-	$26,168	-	-	$25,560	-	-	$23,384	-	-	($2,176)
Securing the Cities	-	-	$21,113	-	-	$21,135	-	-	$21,135	-	-	-
Total	**-**	**-**	**$47,281**	**-**	**-**	**$46,695**	**-**	**-**	**$44,519**	**-**	**-**	**($2,176)**
Subtotal Discretionary - Appropriation	-	-	$47,281	-	-	$46,695	-	-	$44,519	-	-	($2,176)

*FY2016 Funding is shown in notional Common Appropriation Structure for comparison purposes.
** In accordance with common usage, DNDO proposes changing the name of the Federal, State, Local, Territorial, and Tribal Support PPA to the Federal, State, Local, Tribal, and Territorial Support PPA.

Overview

The Domestic Nuclear Detection Office (DNDO) plays a pivotal role in implementing the domestic portion of the Global Nuclear Detection Architecture (GNDA) by ensuring that the training, exercises, and cross-jurisdictional protocols integral to radiological/nuclear (R/N) detection, forensics, and prevention capability elements are adopted and sustained. DNDO's Federal Assistance (FA) budget covers integration and outreach efforts necessary to ensure that GNDA Federal, State, local, tribal, and territorial, (FSLTT) partners have access to and the knowledge of how to leverage available resources to support the R/N detection mission. DNDO structures and resources the FA portfolio of programs to help ensure that R/N detection equipment deployed by FSLTT partners are accompanied by the appropriate concepts of operations (CONOPS), training, exercises, and R/N alarm response protocols. These programs include Securing the Cities (STC); Training, Exercises, and Assistance; and the Joint Analysis Center (JAC).

Federal, State, Local, Territorial, and Tribal (FSLTT) Support: The FSLTT Support PPA provides advisory and assistance services to FSLTT stakeholders who are developing or enhancing R/N detection capabilities. This support includes assistance in developing and integrating local or regional programs into the GNDA, guiding the development of CONOPS and standard operating procedures, and developing training and exercise products to ingrain those procedures into day-to-day activities. In addition, FSLTT Support includes integration and outreach efforts like state and local working groups and leadership advisory committees necessary to ensure that GNDA partners are aware of, have proper contact information for, and have the knowledge needed to properly leverage available resources to support the R/N detection mission.

Securing the Cities: The Securing the Cities PPA seeks to reduce the risk of a successful deployment of a R/N 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.

STC is a multi-year R/N detection capability development project. FA funds are disbursed under the STC Program through competitively awarded cooperative agreements to a lead agency. The lead agency then uses local procurement procedures to acquire equipment and services in support of STC goals and objectives and also establishes a regional governance structure among the major law enforcement, first response, emergency management, and public health agencies to implement a regional R/N detection program.

Federal Assistance
Budget Authority and Obligations
Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$47,281		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$47,281**	**$46,695**	**$44,519**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$9,789	$10,760	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$57,070**	**$57,455**	**$44,519**
Collections – Reimbursable Resources	$50	-	-
Total Budget Resources	**$57,120**	**$57,455**	**$44,519**
Obligations (Actual/Projections/Estimates)	$47,086	$57,455	$44,519
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Federal Assistance
Collections – Reimbursable Resources
Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Homeland Security - Transportation Security Administration	Source	-	-	$50	-	-	-	-	-	-
Total Collections		-	-	**$50**	-	-	-	-	-	-

Federal Assistance
Summary of Budget Changes
Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$47,281**
FY 2016 Revised Enacted	**-**	**-**	**$47,281**
FY 2017 Annualized CR	**-**	**-**	**$46,695**
FY 2018 Base Budget	**-**	**-**	**$46,695**
Transfer to R&D Architecture Planning and Analysis due to CAS Realignment	-	-	($1,118)
Total Transfers	**-**	**-**	**($1,118)**
Total Adjustments-to-Base	**-**	**-**	**($1,118)**
FY 2018 Current Services	**-**	**-**	**$45,577**
Federal, State, Local, Territorial, and Tribal Support	-	-	($1,058)
Total, Program Decreases	**-**	**-**	**($1,058)**
FY 2018 Request	**-**	**-**	**$44,519**
FY 2017 TO FY 2018 Change	**-**	**-**	**($2,176)**

Federal Assistance
Justification of Program Changes
Dollars in Thousands

Program Changes	FY 2018 President's Budget		
	Positions	FTE	Amount
Program Change 1 - Federal, State, Local, Territorial, and Tribal Support	**-**	**-**	**($1,058)**
Federal, State, Local, Territorial, and Tribal Support	-	-	($1,058)
Total Program Changes	**-**	**-**	**($1,058)**

Program Change
Federal, State, Local, Territorial, and Tribal Support

Description
DNDO develops a national framework for implementing R/N detection training for Federal, State and local law enforcement and public safety professionals to enhance national operational capabilities. In FY 2018, DNDO will decrease FSLTT support by $1.058 million overall to include reductions to the Joint Analysis Center (JAC) ($0.708 million), the Assistance program ($0.159 million), the Training program ($0.108 million), the Exercises program ($0.083 million).

DNDO's JAC enhances situational awareness and provides technical support and informational products to Federal, State, and local partners. The JAC maintains and provides awareness to mission partners through visibility into deployed detection capabilities, monitoring ongoing events or threats, and maintaining historical data.

The Assistance Program supports FSLTT partners in developing and implementing R/N detection programs and capabilities. In addition, it provides Mobile Detection Deployment Units (MDDU) to surge assets in support of enhanced steady state deployment postures or special events.

The Training Program, in coordination with FEMA, defines national R/N detection training and qualification standards in addition to developing training courses delivered to GNDA stakeholders.

The Exercises Program evaluates and improves planning and operational capabilities by leading and assisting FSLTT partners in the preparation and execution of exercises, including associated guidance and after-action reporting.

Justification
The $0.708 million reduction in the JAC program is principally achieved as a result of efficiencies in the approach to intelligence collection and analysis, and the completion of the bulk of work to develop "state books" that catalog the capabilities at the state and

local level. The reduction will not affect the delivery of capability and support to state and local partners.

The $0.159 million reduction to the Assistance program will not affect the delivery of capability and support to our state and local partners.

The reductions to the Training ($0.108 million) and Exercises ($0.083 million) programs are a result of operational efficiencies.

Performance

These programs have put in place processes and procedures that will ensure coordination with interagency partners is optimized. The total decrease of ($1.058 million) will have minimal impact on improving and advancing the R/N capabilities to our FSLTT partners.

Federal Assistance
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Federal, State, Local, Territorial, and Tribal Support	$26,168	$25,560	$23,384	($2,176)
Securing the Cities	$21,113	$21,135	$21,135	-
Total	**$47,281**	**$46,695**	**$44,519**	**($2,176)**
Discretionary - Appropriation	$47,281	$46,695	$44,519	($2,176)

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$139	$239	$242	$3
25.1 Advisory and Assistance Services	$17,609	$12,597	$10,434	($2,163)
25.2 Other Services from Non-Federal Sources	-	$548	$573	$25
25.3 Other Goods and Services from Federal Sources	$12,033	$15,611	$15,620	$9
41.0 Grants, Subsidies, and Contributions	$17,500	$17,700	$17,650	($50)
Total - Non Pay Object Classes	**$47,281**	**$46,695**	**$44,519**	**($2,176)**

Federal, State, Local, Territorial, and Tribal Support - PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Federal, State, Local, Territorial, and Tribal Support	-	-	$26,168	-	-	$25,560	-	-	$23,384	-	-	($2,176)
Total	**-**	**-**	**$26,168**	**-**	**-**	**$25,560**	**-**	**-**	**$23,384**	**-**	**-**	**($2,176)**
Subtotal Discretionary - Appropriation	-	-	$26,168	-	-	$25,560	-	-	$23,384	-	-	($2,176)

Federal, State, Local, Territorial, and Tribal Support – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$26,168		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$26,168**	**$25,560**	**$23,384**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$9,224	$9,305	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$35,392**	**$34,865**	**$23,384**
Collections – Reimbursable Resources	$50	-	-
Total Budget Resources	**$35,442**	**$34,865**	**$23,384**
Obligations (Actual/Projections/Estimates)	$25,976	$34,865	$23,384
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Federal, State, Local, Territorial, and Tribal Support – PPA
Collections – Reimbursable Resources

Dollars in Thousands

Collections		FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget		
		Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Department of Homeland Security - Transportation Security Administration	Source	-	-	$50	-	-	-	-	-	-
Total Collections		-	-	**$50**	-	-	-	-	-	-

Federal, State, Local, Territorial, and Tribal Support – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$26,168**
FY 2016 Revised Enacted	**-**	**-**	**$26,168**
FY 2017 Annualized CR	**-**	**-**	**$25,560**
FY 2018 Base Budget	**-**	**-**	**$25,560**
Transfer to R&D Architecture Planning and Analysis due to CAS Realignment	-	-	($1,118)
Total Transfers	**-**	**-**	**($1,118)**
Total Adjustments-to-Base	**-**	**-**	**($1,118)**
FY 2018 Current Services	**-**	**-**	**$24,442**
Federal, State, Local, Territorial, and Tribal Support	-	-	($1,058)
Total, Program Decreases	**-**	**-**	**($1,058)**
FY 2018 Request	**-**	**-**	**$23,384**
FY 2017 TO FY 2018 Change	**-**	**-**	**($2,176)**

PPA Description

FSLTT Support provides advisory and assistance services to FSLTT stakeholders who are developing or enhancing R/N detection capabilities. This support includes assistance in developing and integrating local or regional programs into the GNDA, guiding the development of CONOPS and standard operating procedures, and developing training and exercise products to ingrain those procedures into day-to-day activities. In addition, FSLTT Support includes integration and outreach efforts like state and local working groups and leadership advisory committees necessary to ensure that GNDA partners are aware of, have proper contact information for, and have the knowledge needed to properly leverage available resources to support the R/N detection mission.

Federal, State, Local, Territorial, and Tribal Support – Program Overview

Program	Project	FY 2018 Funding ($000)	Level of Effort	General Description
Joint Analysis Center	JAC Operations	$4,109	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 R/N detection operations, visibility into the status of R/N alarms, and awareness of R/N-related incidents and events.
Joint Analysis Center Collaborative Information System (JACCIS)	JACCIS	$3,350	Ongoing	JACCIS is a web-based system that provides FSLTT stakeholders with alarm adjudication connectivity, a detector database, and situational awareness regarding the events and activities relating to R/N detection and the GNDA.
Federal, State, and Local Outreach	State and Local Stakeholder Working Groups	$300	Semi-Annual, ongoing	SLSWG are DNDO-sponsored strategic engagements intended to promote capability development and sustainment and foster strong relationships with and among SLTT agency mission stakeholders.
	Executive Steering Council	$100	Semi-Annual, ongoing	ESC meetings provide an opportunity for policy coordination, discussion, and implementation among DNDO and senior-level state and local leaders regarding R/N detection programs and the GNDA.
Training	Training	$4,423	Ongoing	The Training Program supports FSLTT GNDA stakeholders. Training establishes qualification standards for R/N 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.
Exercises	Exercises	$2,259	Ongoing	The Exercises Program supports FSLTT and international GNDA stakeholders in developing and/or enhancing R/N detection plans, policies, procedures, communications, tactics, and operations with other relevant stakeholders. The Exercises Program supports the development, validation, and dissemination of R/N detection-specific exercise templates, guidance, and standards; validates that R/N detection equipment is properly employed and alarm adjudication processes are operated per Federal, state, and local protocols; and ensures notifications are escalated to appropriate U.S. Government (USG) agencies. Notably, requests for expertise to enhance exercise design and evaluation methodology continue to increase from Federal and international partners.
Assistance	Assistance	$4,772	Ongoing	The Assistance Program provides standardized processes and products to assist FSLTT agencies with planning, developing, implementing, and sustaining R/N detection programs. Assistance efforts facilitate multi-jurisdictional, multi-disciplinary policy makers, program managers, and

Program	Project	FY 2018 Funding ($000)	Level of Effort	General Description
				operational administrators working together to develop and implement interior and maritime R/N detection programs to expand and enhance the GNDA.
	Mobile Detection Deployment Units (MDDU)	$4,071	Ongoing	MDDUs are national "surge" assets that supplement first responders' existing R/N detection and reporting capabilities in support of national and other special security events. MDDUs contain R/N detection equipment packages housed in mobile trailers that are located throughout the United States and maintained in coordination with the Department of Energy's (DOE) Radiological Assistance Program (RAP).

Joint Analysis Center (JAC) Program

The JAC Program 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 portions of the GNDA. The JAC serves as an interagency coordination mechanism for the GNDA, maintaining situational awareness of GNDA capabilities to include status of R/N detection operations, visibility into the status of R/N alarms, and awareness of R/N-related incidents and events. The JAC participates in adjudication of nuclear detection events; drafts technical requests for information; analyzes intelligence and sensor information; provides technical support to SLTT authorities; and assists in the USG technical response to R/N detection incidents.

The JAC Program maintains a common operating picture for GNDA stakeholders 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 to enable sound and timely leadership decisions. The primary activities under this project include:

- Information product development and deployment which generate packaged information on both a routine and on-demand basis and delivers products directly to stakeholders or publishes information on appropriate community of interest sites. These products include Situational Awareness Reports and Weekly Open Source Reports.
- Operational planning which provides information to DNDO Federal Assistance projects and stakeholders to support and promote the planning and execution of R/N 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 historical knowledge of the operational situation with data derived from a detection event to help set adjudication and post-adjudication action priorities.

- The JAC provides a 24-hour/7-days-per-week (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 conducts fusion of multiple data sources to provide a complete view of the operational environment, develops awareness within the nuclear detection community to enable alarm resolution at the lowest level possible, and ensures that the community has access to and training on the best analytic tools.
- The JAC maintains a qualified and trained expert workforce to accomplish all of the above duties.

In FY 2016, the JAC initiated mapping of the international portion of the GNDA. The JAC also continued to provide recurring products for DNDO leadership and GNDA stakeholders, including weekly presentations of GNDA-related intelligence information, Situational Awareness Reports, and Weekly Open Source Reports for FSLTT stakeholders.

In FY 2017, the JAC will continue its mapping of the international portion of the GNDA, drawing upon a new data sharing arrangement. The JAC will also provide the secure infrastructure and initial planning for a DNDO crisis management function for awareness during global incidents.

In FY 2018, the JAC will lead the DNDO crisis management function with 24/7 support to leadership and other designated stakeholders during ongoing situations.

Joint Analysis Center Collaborative Information System (JACCIS) Program

To support the JAC's information sharing and information analysis roles, DNDO developed its information technology system, the Joint Analysis Center Collaborative Information System (JACCIS). JACCIS receives, manages, analyzes, transfers, and reports on data relevant to the GNDA. JACCIS integrates information the JAC receives through focused fusion of 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 technical experts around the United States. Prior to JACCIS achieving initial operational capability in FY 2011, the JAC relied on resource-intensive phone and e-mail communication to integrate data.

In FY 2016, JACCIS 2.0 transitioned into a cloud environment providing a faster, scalable, and lower-cost hosting solution that incorporates a live feed into the DHS National Operations Center Common Operating Picture. In FY 2017, JACCIS will incorporate a detector information and port-of-entry wiki. This wiki – a collaboratively-edited repository of information – will continue to grow as it adds additional detector data sets for a growing number of states and major urban areas, will aid in alarm adjudication awareness, and will continue to build upon FSLTT relationships via coordination with the Assistance and Training Programs. In FY 2018, JACCIS will integrate data analysis tools for use by FSLTT stakeholders.

Federal, State, and Local Outreach Program

Central to the success of an integrated, layered national defense against the R/N threat is a strong partnership with FSLTT agencies responsible for the R/N detection mission within their areas of responsibility. The Federal, State, and Local Outreach Program maintains engagement with key mission partners and increases awareness of DNDO threats and risk by executing broad outreach efforts that include:

- Conducting stakeholder events; and
- Establishing communication mechanisms to facilitate interactions with and among state and local stakeholders.

A key to developing, maintaining, and expanding R/N detection programs and capabilities across the United States is affording FSLTT stakeholders the opportunity to engage one another and share best practices and challenges. The major elements of this program include the SLSWG and ESC projects. These activities support the development of a sustainable partnership between DNDO and the state and local community to strengthen national R/N detection capabilities in support of the GNDA.

State and Local Stakeholder Working Group (SLSWG) Project

As required in the Security and Accountability For Every (SAFE) Port Act (Public Law 109-347), DNDO is responsible for coordinating with state and local jurisdictions across the Nation. The SLSWG Project is a key mechanism for information sharing and coordinating activities with the mission community. SLSWGs are DNDO-sponsored strategic engagements intended to promote R/N detection capability development and sustainment, and foster strong relationships with and among mission stakeholders. Annual

SLSWG meetings provide a forum for stakeholders to exchange best practices, obtain feedback on DNDO's initiatives, and interact with subject matter experts. At SLSWG meetings, participants present and discuss current activities and initiatives, lessons learned, available tools, and reports.

Executive Steering Council (ESC) Project

The ESC annual meetings provide an opportunity for policy coordination, discussion, and implementation among DNDO and senior-level state and local leaders regarding R/N detection programs. The ESC attendees include Homeland Security Advisors and other executive-level stakeholders. 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 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 R/N threat updates, mission challenges, and Federal efforts to improve FSLTT coordination. The ESC meeting apprises executive leadership of ongoing efforts in support of their jurisdictions and promotes the senior-level mission advocacy needed to sustain state and local R/N detection programs and capabilities. Attendance at the ESC meetings has grown over the years, with a four-fold increase in numbers of attendees and numbers of states represented, demonstrating the success of DNDO outreach efforts and that GNDA stakeholders value the meetings.

Assistance Program

The Assistance Program provides standardized processes and products to assist SLTT agencies with planning, developing, implementing, and sustaining R/N detection programs. The Assistance Program is designed to facilitate multi-jurisdictional, multi-disciplinary policy-makers, program managers, and operational administrators working together to develop and implement interior and maritime R/N detection programs to expand the interior layer and enhance 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 U.S. interior R/N detection capabilities by assisting states, major Urban Area Security Initiative (UASI) cities, and United States Coast Guard (USCG) Area Maritime Security Committees (AMSC) to develop, implement, and sustain R/N detection programs. A focused activity within the Assistance Program is maritime capability development which works with the AMSCs to develop maritime based R/N 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.

The Assistance Program uses a system of standardized processes to guide SLTT authorities through a series of development phases. This phased approach includes providing comprehensive guidance for the planning, organizing, equipping, training, and exercising process creating a sustainable framework for the administration of a domestic preventive R/N detection program at the senior

policymaking, middle management, and operational levels. The Assistance Program met its FY 2015 goal to make positive contact with all 50 states, consisting of introductory awareness-raising meetings with senior state officials. The program followed up on these contacts to work with the states to develop and implement R/N detection programs consisting of CONOPS, agency and special event standard operating procedures, and training and exercise plans. The Assistance Program has produced steady progress in numbers of states developing and implementing R/N detection programs with underlying capabilities. By the end of FY 2018, the program's goal is for all 50 states, all 11 major UASIs, and all 43 USCG Sector AMSCs to have active, viable, and sustainable R/N detection programs.

DNDO continues to work with DHS partners to enhance their R/N detection program and capabilities. In addition to work with U.S. Customs and Border Protection, the USCG, and Transportation Security Administration, DNDO is working with other DHS agencies to assist in designing and implementing a comprehensive R/N detection program and capability. These assistance efforts include: supporting training and exercises, planning, facilitating meetings and workshops, and providing equipment information for R/N detection equipment purchasing.

Mobile Detection Deployment Units (MDDU) Project

The MDDU Project provides detection equipment packages for FSLTT authorities to augment their R/N detection capability and support special events and enhanced steady state operations. The MDDU Project includes six units pre-staged at DOE RAP team locations around the United States and outfitted with R/N 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 110 MDDU deployments in FY 2016, an increase of more than 30 percent over the 83 MDDU deployments in FY 2015. The MDDU program anticipates a deployment increase of 10 percent per year over the next two years. To address increased demand in MDDU support, the Assistance Program has implemented a more efficient deployment methodology by shipping equipment only instead of deploying a full MDDU package when possible. This package can be accompanied by one subject-matter expert to provide training, operational recommendations and equipment technical support. This agile model will allow the program to support additional requests over time.

Training Program

The Training Program supports FSLTT stakeholders in developing or enhancing their R/N detection training. The Training Program evaluates GNDA stakeholder R/N detection capability and provides data used to assess R/N detection operational effectiveness. It is responsible for the development, oversight, and administration of the design, delivery, evaluation, and continual improvement of R/N detection training. The 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 and/or improving 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 and/or improving effective Training Standards and Qualifications for R/N detection to assist state and local agencies in developing uniform training qualification standards. To achieve a national-level standardized preventive R/N detection (PRND) capability, the Training Program has submitted the definitions for the roles and responsibilities of PRND primary and secondary screeners, team operators, team leaders, and prerequisite training standards to Federal Emergency Management Agency's National Integration Center – the organization responsible for managing the implementation and review of the National Incident Management System (NIMS) - for review and inclusion in national preparedness doctrine. These PRND-related 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 R/N detection training curriculum across the Nation. This will result in responders having more standard PRND capabilities when working missions across multiple jurisdictions.

The Training Program both develops and delivers PRND training in concert with partner training providers in order to reach as many stakeholders as possible. Training "delivery" consists of courses actually taught by Training Program staff or contracted instructors, while "supported" training consists of training activities where the Training Program contributed to a course by providing content, instructors, or radiological sources.

In FY 2016, the Training Program conducted 36 courses and supported another 225, which combined, trained more than 6,000 participants. In FY 2017, the program will deliver 34 courses and support another 250, which combined, will train an estimated 6,500 participants. In FY 2018, the program will deliver 34 courses, support another 250, and when combined with the expansion of the current on-line training courses will train an estimated 8,000 participants. These efforts will result in significant increases in R/N detection capability within a variety of agencies throughout the United States.

Exercise Program

The Exercises Program seeks to validate and enhance emerging capabilities and systems in an effort to coordinate and integrate detection of nuclear or other radioactive materials out of regulatory control. This is accomplished by providing a range of support services and expertise to FSLTT and international GNDA stakeholders. The Exercise Program regularly updates R/N detection-specific exercise materials, both for use by exercise planners and distribution for use by stakeholders and partners upon request, including a variety of templates, tools, and guidance. These proven exercise practices are all in accordance with the Homeland Security Exercise and Evaluation Program (HSEEP) methodology and are also applicable for exercise requirements not associated

with the HSEEP methodology.

The level of direct support provided for the planning, design, execution, and evaluation of exercises is dependent upon the stakeholders' level of knowledge and experience in conducting the R/N detection mission, as well as the availability of resources to the requesting stakeholder. The majority of support requests received by the Exercise Program are to lead the planning, design, conduct, and evaluation of the exercise. The Exercise Program does, however, frequently support limited requests, such as providing licensed radioactive sources or subject-matter experts for exercise evaluation of specific R/N detection capabilities.

Areas of priority for the Exercise Program in FY 2017 and FY 2018 include advancing the GNDA mission through continued direct exercise support, increased sharing of exercise best practices, incorporating innovative exercise efficiencies, and promoting self-sustainment through enhanced collaboration with federal partners.

Adjustments to Base Justification

DNDO continues to examine and mature its implementation of the Common Appropriation Structure. As part of a review of program alignment, adversary analysis and capability integration activities and funding were identified as being more effectively integrated into the Architecture Planning and Analysis PPA in Research and Development. This $1.118 million transfer would consolidate adversary analysis and capability-based planning functions with architecture, risk, and other similar functions already in the Architecture Planning and Analysis PPA. This will result in more holistic analysis products that better advance DNDO's ability to understand, anticipate, and reduce the threat of radiological and nuclear terrorism.

Federal, State, Local, Territorial, and Tribal Support – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Federal, State, Local, Territorial, and Tribal Support	$26,168	$25,560	$23,384	($2,176)
Total	**$26,168**	**$25,560**	**$23,384**	**($2,176)**
Discretionary - Appropriation	$26,168	$25,560	$23,384	($2,176)

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$101	$208	$207	($1)
25.1 Advisory and Assistance Services	$14,034	$9,193	$6,984	($2,209)
25.2 Other Services from Non-Federal Sources	-	$548	$573	$25
25.3 Other Goods and Services from Federal Sources	$12,033	$15,611	$15,620	$9
Total - Non Pay Object Classes	**$26,168**	**$25,560**	**$23,384**	**($2,176)**

Federal, State, Local, Territorial, and Tribal Support – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Joint Analysis Center	$6,915	$7,063	$4,109	($2,954)
JACCIS	$3,557	$3,541	$3,350	($191)
Assistance	$8,648	$8,239	$8,843	$604
Training	$3,843	$3,966	$4,423	$457
Exercises	$1,840	$1,879	$2,259	$380
Federal, State, and Local Outreach	$1,365	$872	$400	($472)
Total – Non Pay Cost Drivers	**$26,168**	**$25,560**	**$23,384**	**($2,176)**

NARRATIVE EXPLANATION OF CHANGES

DNDO balanced program requirements while supporting the FY 2018 President's Budget. The changes in the previous table reflect the $1.118 million transfer to the Architecture Planning and Analysis PPA and the $1.058 million program change for FSLTT Support PPA. The funding transfer is made to align with DNDO's mission to prevent nuclear terrorism by continuously improving capabilities to deter, detect, respond to, and attribute attacks, in coordination with domestic and international partners. The transfer consolidates adversary analysis and capability-based planning functions with architecture, risk, and other similar functions already in the Architecture Planning and Analysis PPA. This will result in more holistic analysis products that better advance DNDO's ability to understand, anticipate, and reduce the threat of radiological and nuclear terrorism. The remaining adjustments align program funding with objectives for FY 2018 and reflect prioritization between program areas.

Securing the Cities - PPA

Budget Comparison and Adjustments

Comparison of Budget Authority and Request

Dollars in Thousands

Organization	FY 2016 Revised Enacted			FY 2017 Annualized CR			FY 2018 President's Budget			FY 2017 to FY 2018 Total Changes		
	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount	Pos.	FTE	Amount
Securing the Cities	-	-	$21,113	-	-	$21,135	-	-	$21,135	-	-	-
Total	**-**	**-**	**$21,113**	**-**	**-**	**$21,135**	**-**	**-**	**$21,135**	**-**	**-**	**-**
Subtotal Discretionary - Appropriation	-	-	$21,113	-	-	$21,135	-	-	$21,135	-	-	-

Securing the Cities – PPA
Budget Authority and Obligations

Dollars in Thousands

Budget Authority	FY 2016	FY 2017	FY 2018
Enacted	$21,113		
Transfers & Reprogrammings	-		
Delta in Enacted Fee Estimate to Fee Actuals	-		
Enacted Rescissions to Prior Year	-		
Revised Enacted/Request	**$21,113**	**$21,135**	**$21,135**
Carryover and/or Recoveries (Actual/Estimates/Projections)	$565	$1,455	-
Rescissions to Current Year/Budget Year	-	-	-
Net Sequestered Resources	-	-	-
Supplementals	-	-	-
Total Budget Authority	**$21,678**	**$22,590**	**$21,135**
Collections – Reimbursable Resources	-	-	-
Total Budget Resources	**$21,678**	**$22,590**	**$21,135**
Obligations (Actual/Projections/Estimates)	$21,110	$22,590	$21,135
Personnel: Positons and FTE			
Enacted/Request Positions	-	-	-
Enacted/Request FTE	-	-	-
Onboard and Actual FTE; Includes Collections - Reimbursable Resources			
Onboard (Actual/Estimates/Projections)	-	-	-
FTE (Actual/Estimates/Projections)	-	-	-

Securing the Cities – PPA
Summary of Budget Changes

Dollars in Thousands

Budget Formulation Activity	Positions	FTE	Amount
FY 2016 Enacted	**-**	**-**	**$21,113**
FY 2016 Revised Enacted	**-**	**-**	**$21,113**
FY 2017 Annualized CR	**-**	**-**	**$21,135**
FY 2018 Base Budget	**-**	**-**	**$21,135**
FY 2018 Current Services	**-**	**-**	**$21,135**
FY 2018 Request	**-**	**-**	**$21,135**
FY 2017 TO FY 2018 Change	**-**	**-**	**-**

PPA Description

The STC Program seeks to reduce the risk of a successful deployment of a R/N 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.

STC is a multi-year R/N detection capability development project. FA funds are disbursed under the STC Program through competitively awarded cooperative agreements to a lead agency. The lead agency then uses local procurement procedures to acquire equipment and services in support of STC goals and objectives and also establishes a regional governance structure among the major law enforcement, first response, emergency management, and public health agencies to implement a regional R/N detection program.

Program	Project	FY 2018 Funding ($000)	Level of Effort	General Description
Securing the Cities	National Capital Region (NCR)	$2,080	Annual, ongoing	The STC Program seeks to reduce the risk of a successful deployment of a R/N 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. Funding for the NYC/Newark and LA/Long Beach implementations is complete.
	Houston	$4,801	Annual, ongoing	
	Chicago	$9,825	Annual, ongoing	
	Implementation #6 - TBD	$3,495	Annual, ongoing	
	STC Program Support	$934	Annual, ongoing	STC Program Office contracted services and travel that supports all STC implementations. Contracted services include program office support personnel and establishing information sharing capabilities.

The STC Program employs a three-phase strategy to provide financial assistance to multiple regions simultaneously while expanding capabilities to further implement the domestic portion of the GNDA. The three phases of the program are:

Phase I – Initial Operating Capability

STC provides a mechanism for cities to develop an initial operating capability to detect and report the presence of nuclear and other radioactive materials that are out of regulatory control using equipment, protocols, and personnel in support of the GNDA. During Phase I, efforts focus on satisfying the immediate needs of state and local agencies in developing detection and reporting capabilities. STC provides financial resources and expertise to boost partners' understanding and awareness of the nuclear threat, enhance regional capabilities to detect and interdict nuclear threats, and increase 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 to sustain the program over time in support of the GNDA. This phase of the implementation is expected to take the first three years of the engagement.

Phase II – Integration

STC provides additional financial resources to enable development of enhanced detection, analysis, communication, and coordination functionality. This builds on the integration of state and local capabilities with 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 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 two years.

Phase III – Sustainment

Following the conclusion of Phase II, DNDO provides indirect, non-financial support to sustain the program in accordance with the cooperative agreement with region. 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. Examples of other R/N detection programs within DNDO that provide support include:

- Systems engineering and evaluation programs which provide detection equipment testing to aid partners in making equipment decisions.
- Product acquisition and deployment support programs which provide guidance to help interpret equipment specifications so STC partner operators clearly understand equipment capabilities.
- Transformational and applied research program offices which explore emerging radiation detection technology and partner with Phase III STC implementations to be test-beds for technology demonstrations.
- Red Teams which operate in overt or covert modes to assist STC stakeholders in understanding potential vulnerabilities.
- Operations support teams which provide training materials and exercise support.

STC typically requires a nine-month process to issue a cooperative agreement for each metropolitan area. This causes cooperative agreements to be issued late in the fiscal year and implementation start dates beginning in the following fiscal year.

The Los Angeles/Long Beach implementation received its last STC funding installment in late FY 2016 and is projected to transition into the Sustainment Phase in FY 2018. The region will no longer receive STC funding, but DNDO will continue to provide indirect non-financial assistance as described in Phase III activities above.

The NCR is expected to complete Phase I activities during FY 2017. In FY 2018, the region is projected to receive its last STC funding installment of up to $2 million as it completes Phase II activities in FY 2019.

The Houston region will continue Phase I activities through FY 2018. The region is projected to receive up to $5 million in late FY 2018 and enter Phase II in FY 2019.

The Chicago region is projected to receive up to $10 million in FY 2018 as it builds its Phase I initial operating capability.

The sixth and seventh STC implementations will be selected via a competitive funding opportunity late in FY 2018. The initial award of up to $5 million for STC implementation six is scheduled to occur before the end of FY 2018 with initial Phase I activities scheduled to occur in FY 2019.

Securing the Cities – PPA
Non Pay Budget Exhibits

Non Pay Summary

Dollars in Thousands

Organization	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Securing the Cities	$21,113	$21,135	$21,135	-
Total	**$21,113**	**$21,135**	**$21,135**	-
Discretionary - Appropriation	$21,113	$21,135	$21,135	-

Non Pay by Object Class

Dollars in Thousands

Non-Pay Object Classes	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Change
21.0 Travel and Transportation of Persons	$38	$31	$35	$4
25.1 Advisory and Assistance Services	$3,575	$3,404	$3,450	$46
41.0 Grants, Subsidies, and Contributions	$17,500	$17,700	$17,650	($50)
Total - Non Pay Object Classes	**$21,113**	**$21,135**	**$21,135**	**-**

Securing the Cities – PPA
Non Pay Cost Drivers

Dollars in Thousands

Leading Non Pay Cost-Drivers	FY 2016 Revised Enacted	FY 2017 Annualized CR	FY 2018 President's Budget	FY 2017 to FY 2018 Total Changes
Los Angeles / Long Beach	$1,800	-	-	-
National Capital Region	$6,360	$4,300	$2,080	($2,220)
Houston	$8,315	$8,100	$4,801	($3,299)
Chicago	$3,500	$7,125	$9,825	$2,700
Implementation #6 – TBD	-	-	$3,495	$3,495
STC Program Support	$1,138	$1,610	$934	($676)
Total – Non Pay Cost Drivers	**$21,113**	**$21,135**	**$21,135**	**-**

NARRATIVE EXPLANATION OF CHANGES

The Los Angeles/Long Beach implementation received its last STC funding installment in late FY 2016 and is projected to transition into the Sustainment Phase in FY 2018. The region will no longer receive STC funding, but DNDO will continue to provide indirect non-financial assistance as described in Phase III activities.

The National Capital Region is expected to complete Phase I activities during FY 2017. In FY 2018, the region is projected to receive its last STC funding installment of up to $2 million as it completes Phase II activities in FY 2019.

The Houston region will continue Phase I activities through FY 2018. The region is projected to receive up to $5 million in late FY 2018 and enter Phase II in FY 2019.

The Chicago region is projected to receive up to $10 million in FY 2018 as it builds its Phase I initial operating capability.

The sixth and seventh STC implementations will be selected via a competitive funding opportunity late in FY 2018. The initial award of up to $5 million for STC implementation six is scheduled to occur before the end of FY 2018 with initial Phase I activities scheduled to occur in FY 2019.

Projected STC Program Support funding requirements decreased due to reduction in level of effort for the contract providing information sharing services and the reduction in STC Program Office support contractor staff.