Inspection and Detection Technology

Multi-Year Investment and Management Plan

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Fiscal Year 2016 Report to Congress

Homeland Security

U.S. Customs and Border Protection

Executive Summary

The U.S. Customs and Border Protection (CBP) Inspection and Detection Technology Multi-Year Investment and Management Plan was prepared to satisfy a requirement in the Joint Explanatory Statement and Senate Report 114-68, which accompany the *Fiscal Year* (FY) *2016 Department of Homeland Security* (DHS) *Appropriations Act* (P.L. 114-113). The public plan describes CBP's five-year investment plan for Non-Intrusive Inspection (NII) system. The plan covers FY 2016 – FY 2021 and is limited to CBP's large- and small-scale NII system investment.

CBP's mission is to safeguard America's borders thereby protecting the public from dangerous people and materials while enhancing the Nation's global economic competitiveness by enabling legitimate trade and travel. To achieve our mission, CBP uses a layered enforcement strategy to monitor, regulate, and facilitate the flow of goods. A critical layer within this strategy is the use of technology, specifically NII technology and Radiation Detection Equipment[1], to detect and interdict contraband while facilitating the flow of commerce.

The current fleet of NII technology consists of 315 large-scale (LS) NII and 4,204 small-scale (SS) NII, of which 14 percent of LS is at or past its estimated useful life as of September 30, 2015. CBP and our mission partners are committed to sustaining the capability by extending the service life, and improving or replacing systems with technology that promotes integration, automation, and agility across border security operations. As described in Table 1 and based on the FY 2016 enacted appropriations and FY 2017 President Budget request, CBP plans to invest approximately $145 million to acquire NII technology and $238 million for maintenance, operations and support. CBP's FY 2018 – 2021 technology needs are based on lifecycle cost estimates, and budget plans are not included within this document.

Table 1: **NII Technology Funding ($ in millions)**		
	FY 2016[2]	**FY 2017**
NII Technology Acquisition	$90.26	$54.82
NII Operations and Maintenance[2]	$119.01	$118.97
NII Appropriations	**$209.27**	**$173.79**

This plan is organized to provide background information of the plan, describe CBP's NII technology inventory inclusive of the age of the fleet, and describe the FY 2016 - FY

[1] The DHS Domestic Nuclear Detection office acquires CBP's stand-alone radiation detection equipment. Radiation detection equipment is excluded from the scope of this plan.
[2] NII technology operations and maintenance funding includes operations and maintenance for radiation detection equipment post one-year of deployment.

2017 funding and proposed procurement needs between FY 2016 – FY 2021. Values within this plan are based on available funds and current operational requirements.

Inspection and Detection Technology Multi-Year Investment and Management Plan (FY 2016 – FY 2021)

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I. Legislative Language

This document was compiled pursuant to the legislative language set forth in the Joint Explanatory Statement and Senate Report 114-68, which accompany the *Fiscal Year* (FY) *2016 Department of Homeland Security* (DHS) *Appropriations Act* (P.L. 114-113).

The Joint Explanatory Statement states:

> CBP shall submit to the Committees, with the fiscal year 2017 budget request, a multi-year investment and management plan for inspection and detection technology that: (1) inventories such equipment by location, type, age, and date of deployment; (2) outlines existing equipment acquisition plans by type, number, schedule, and total cost of operations and maintenance; and (3) forecasts a recapitalization plan supported by a current acquisition program baseline (APB). The APB shall: (a) align the acquisition of each technology to mission requirements; (b) define the life-cycle costs for each technology; (c) detail an equipment decommissioning schedule; and (d) compare actual versus planned obligations. A version of the multi-year investment and management plan shall be made available to the public at the same time.

Senate Report 114-68 states:

> The Committee provides $171,000,000 for Inspection and Detection Technology, including $48,100,000 for additional Non-Intrusive Inspection [NII] equipment refresh and recapitalization. The Committee is aware that a significant portion of imaging equipment is past its estimated 10-year lifespan and remains concerned by the absence of a multi-year investment and management plan, which CBP has failed to submit to the Committee in a timely manner. The Committee requests CBP produce a 5-year investment and management plan at the time of the fiscal year 2017 budget request. The investment and management plan shall be submitted in classified, if necessary, and unclassified format, with the unclassified version made public on CBP's Web site.

II. Background

U.S. Customs and Border Protection (CBP) is the frontline border security agency within DHS responsible for the priority mission of preventing terrorists, terrorist weapons and other contraband from entering the United States, while also facilitating the flow of legitimate trade and travel. More than 60,000 CBP employees, along with other interagency and intra-agency organizations, are responsible for protecting more than 5,000 miles of border with Canada, 1,900 miles of border with Mexico, and 95,000 miles of shoreline. On a typical day, CBP processes over 1 million passengers and pedestrians, more than 70,000 pieces of cargo and conveyances, and more than 300,000 privately owned vehicles entering the country at air, land, and sea ports of entry.

CBP accomplishes these results through a layered enforcement strategy that combines our frontline workforce, technology, tactical, and infrastructure resources to secure our Nation's borders. At the cornerstone of our inspection and detection capabilities are non-intrusive inspection (NII) systems and radiation detection equipment (RDE) used to detect the illegal transit of drugs, people, and weapons of mass effect hidden in cargo containers and other conveyances. These systems are viewed as force multipliers, with tremendous economic impact, that enable CBP to inspect a larger portion of the stream of traffic while facilitating the flow of legitimate trade, cargo, and passengers. Currently[3], CBP's frontline officers and agents operate 315 large-scale (LS) and 4,204 small-scale (SS) NII systems, 1,281 radiation portal monitors (RPMs), and 35,538 SS RDEs.

CBP's priorities for NII systems are to: (1) continue to deploy technology to support port of entry expansion and reconfigurations, (2) sustain interdiction and detection capability through equipment recapitalization, and (3) deploy technology that promotes automation, integration, and agility across border security operations. Since 2013, CBP has worked closely with internal and external stakeholders to right-size resources as NII technology were facing serious capability gaps because of an aging fleet and system performance issues. On the basis of the FY 2016 enacted appropriations and FY 2017 President Budget, CBP will have the ability to sustain capability by deploying solutions to address port expansion projects and support NII recapitalization efforts with technology that enables operational efficiencies.

CBP will continue to work with stakeholders and align resources to achieve DHS's securing the border mission objectives.

III. Inspection and Detection Technology Status

A. NII Systems Description

[3] Unit quantities as of September 30, 2015

NII systems enable CBP's interdiction and security efforts by providing capabilities that help CBP officers and agents examine a large volume of traffic safely, quickly, and effectively to detect a wide range of contraband and weapons of mass effect that is imported using a variety of conveyances. NII systems include two classes of equipment, LS and SS, and are used by CBP frontline officers and agents between ports of entry and at land, sea, and air ports of entry to screen conveyances for contraband such as weapons (to include weapons of mass destruction), drugs, narcotics, money, stowaways, and other illicit material.

NII System Description and Operational Utility

- LS NII systems are capable of imaging an entire conveyance. These systems possess unique performance characteristics that provide CBP with an enhanced capability to image both laden cargo conveyances and passenger vehicles for the presence of contraband (i.e., weapons, money, narcotics, etc.). LS NII also provides CBP with capabilities to detect the presence of weapons of mass destruction. System types include fixed and mobile x-ray or gamma-ray imaging technology for cargo trucks, cargo containers, trains, palletized cargo, and fixed and mobile backscatter technology for passenger vehicles and buses. LS NII also includes an emerging type of multimode technologies that integrates x-ray and radiation detection in a single platform. CBP is the primary DHS operator of LS NII and operates the systems in some Container Security Initiative (CSI) foreign seaports of departure and at domestic land, sea, and airports on entry and at Border Patrol checkpoints.

- SS NII systems are used to perform non-intrusive inspections on passenger baggage and cargo; view inside of fuel tanks and small compartments; identify density anomalies in the shells of vehicles, behind walls of conveyances, and in propane tanks; and identify false walls in containers. System types include x-ray vans, baggage x-ray systems, density meters, fiberscopes, and tool trucks. SS NII is operated by CBP in some CSI foreign seaports of departure and at domestic land, sea, and air ports on entry and at Border Patrol checkpoints.

B. Accomplishment and Planned Milestones

FY 2015 Accomplishments

Scanning Mission: CBP used LS NII systems to conduct more than 7 million examinations in the land, air, and sea environments, which resulted in 2,451 seizures, including over 390,000 pounds of narcotics, 61 stowaways, and more than $4.1 million in

U.S. currency. These systems are deployed at ports where 96 percent of cargo arrives in the United States.

Operational Efficiencies: CBP and DNDO continued to deploy revised operational settings (ROS) on fixed and mobile RPMs. ROS are deployed on RPMs across 28 sea ports of entry and 15 land border crossings, and has reduced nuisance alarm rates by an average of 78 percent. This equates to more than 200,000 alarms per year (or more than 50,000 hours in processing time) allowing for the redirection of 88 CBP officers to other high-priority mission areas.

Integration, Automation, and Agility: CBP, in collaboration with the DHS Science and Technology Directorate, spearheaded and finalized a project to exchange real-time fixed rail NII system images wirelessly between CBP and Mexico to relieve traffic congestion. CBP also successfully demonstrated the use of next-generation RPMs for land border rail scanning. The next-generation RPM was integrated with a rail x-ray NII system and the combination system showed sufficient capability to make the operations viable without adversely affecting commerce. Furthermore, CBP conducted and completed a technology demonstration which demonstrated the integration of NII technology and RDE and Port Radiation Inspection Detection Equipment (PRIDE) and Automated Targeting System – Cargo Enforcement Reporting and Tracking System. The demonstration identified efficiencies to improve CBP officers' activities by reducing administrative actions and activities.

FY 2016 Planned Accomplishments

Recapitalization and Deployments to Sustain Operations: CBP will continue to manage the inspection and detection technology fleet and address the challenges required to secure the flow of trade and travel. The FY 2016 enacted appropriation allows CBP to procure 36 LS NII systems and 596 SS NII systems, of which 79 percent of LS and 48 percent of SS are direct replacements for systems that have reached or exceeded their estimated useful service life. The remaining procurements will address additional systems required for port reconfiguration and expansion activities. With the expansion of the Panama Canal, more commercial cargo will move to ports and rail border crossings throughout the United States. Current systems are being recapitalized with improved capabilities to sustain operations and keep pace with the forecasted increase in cargo arriving into the United States. Without the planned recapitalization of inspection and detection technology, maintenance costs would rise, systems would become obsolete, and system downtime would rise, all affecting the effectiveness and cost of inspections because of the need for manual inspections, ultimately delaying the movement of legitimate trade and travel.

Operational Efficiencies: CBP will continue to work with DNDO to evaluate technology, which can further reduce nuisance alarms, and concepts of operation that

enable remote operations at many locations. A pilot demonstration will be conducted to determine what additional technologies are needed to transition to remote operations. This pilot will evaluate select operational and technology improvements and take advantage of advancements to promote efficient and effective processing of alarming conveyances, reduce operational impact by RPMs on the flow of legitimate trade, and optimize CBP staffing. A second pilot will install next-generation RPM technology at the Nation's largest seaport terminal. This pilot will evaluate if a further reduction in nuisance alarms could be achieved to foster remote operations at select seaport locations.

Integration, Automation, and Agility: CBP will continue to deploy PRIDE across RPM sites. PRIDE increases CBP officer productivity by improving the ability to group and share RPM alarm data. Additionally, its enhanced security minimizes the efforts to transfer and upload the NII systems' images. Following the success of the FY 2015 integrated technology demonstration in Laredo, Texas, CBP and partners will initiate the recapitalization of NII Vehicle and Cargo Inspection Systems (VACIS) at rail border crossings. Replacing the older VACISs with newer technology that offers additional capabilities that will increase the effectiveness of inbound rail processing in a manner that is more efficient for both CBP and the trade community. The rail recapitalization is a lynchpin of CBP's overall NII Recapitalization Strategy. Procuring these solutions is critical to our integration, automation, and agility across border security operations, and will enhance national security by redirecting officers and agents to other enforcement duties, as well as increase safety across our workforce.

C. Current Inventory

Table 2 and table 3 summarize CBP's domestically deployed NII technology by type and average age as of September 30, 2015.

Table 2: CBP-Deployed Large Scale NII Technology (Domestic)

Type	Quantity	Age of Equipment		
		Average	Youngest	Oldest
High-Energy Fixed X-Ray	15	3.6	1.2	8.4
High-Energy Mobile X-Ray	48	6.2	2.9	9.2
High-Energy Rail X-Ray	1	3.0	3.0	3.0
Medium-Energy Fixed Gamma Ray	26	8.0	6.2	11.6
Medium-Energy Mobile Gamma Ray	61	11.7	0.8	15.1
Medium-Energy Rail Gamma Ray	26	10.6	4.9	15.2
Medium-Energy Mobile X-Ray	14	0.8	0.2	1.9
Medium-Energy Pallet Gamma Ray	6	11.4	11.0	11.8
Medium-Energy Portal Gamma Ray	18	5.6	2.9	11.0
Low-Energy Mobile X-Ray	74	5.8	4.5	8.6

Table 2: CBP-Deployed Large Scale NII Technology (Domestic)				
Type	**Quantity**	**Age of Equipment**		
		Average	**Youngest**	**Oldest**
Low-Energy Portal X-Ray	26	2.9	1.5	7.2

Table 3: CBP-Deployed Small Scale NII Technology (Domestic)				
Type	**Quantity**	**Age of Equipment**		
		Average	**Youngest**	**Oldest**
Mobile Ramp System	12	11.1	10.8	11.3
Tool Truck	105	10.7	0.0	17.7
X-Ray	460	7.9	0.0	22.8
Mobile Ramp System	12	11.1	10.8	11.3
Handheld - Buster	1,866	10.8	4.5	27.0
Handheld - Fiberscope	1,364	6.6	0.0	31.8
Handheld - Vapor Tracer	110	13.0	3.9	14.0
Handheld - Itemizer	42	15.8	10.2	19.4
Handheld - Survey Meter	245	8.8	2.2	13.3

The estimated useful life of NII technology is 10-years; however, routine analysis shows equipment can operate beyond 12 years. This analysis is based on an assessment of various service life metrics, maintenance strategies, and technology refresh activities. Based on continual assessment CBP aims to replace equipment between 10 – 14 years, or prior to making significant investment in refurbishing equipment (e.g., repair or refurbishment cost exceeding the standard of 65 percent of replacement value).

D. Replacement and Decommissioning Schedule

Table 4 reflects the quantity of NII technology required to support normal life cycle replacements and accounts for new technology required to address operational needs.

Table 4: CBP NII Systems FY 2016–FY 2021 - Replacement and New Systems						
System Type	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**	**FY21**
LS NII System (replace)	28	17	37	3	34	29
LS NII System (new)	8	5	7	6	0	0
LS NII System Total	**36**	**22**	**44**	**9**	**34**	**29**
SS NII System (replace)	286	171	632	358	548	348
SS NII System (new)	310	66	59	0	63	82
SS NII System Total	**596**	**237**	**691**	**358**	**611**	**430**

Approximately 85 percent of LS- and 80 percent of SS- NII technology needs will address equipment replacements, and the remaining 20 percent of LS and 15 percent of SS are new technology that will be fielded where NII capabilities are not presently deployed. Older systems will be decommissioned after the deployment of the replacement system. Decommissioned systems may be refurbished, as needed, and relocated to support existing or emerging field requirements. Technology is typically deployed within six to twelve months of procurement.

IV. Current Funding and Procurement Plan

CBP is procuring NII technology to accommodate recapitalization and increased growth to optimize vigilance and operational efficiencies without impact to trade and travel. CBP identifies recapitalization and growth requirements based on the equipment's age and reliability/ availability/ maintenance data; emerging field requirements such as new domestic ports or domestic port reconfigurations or the need for enhanced technological capability; and the need to deploy to locations without existing capability. For long-term lifecycle planning, CBP utilizes lifecycle cost estimates to manage cost baselines, determine affordability and prioritize recapitalization/ growth requirements. Plans are routinely assessed and updated to based on available funds and emerging needs.

A. Funding Level and Sources

FY 2016 – FY 2021 procurement needs are based on the FY 2016 enacted appropriations, the FY 2017 President Budget request, and FY 2018 – FY 2021 plans are based on the NII Technology Lifecycle Cost Estimate. In FY 2016, CBP's Inspection and Detection Technology Program, Project, and Activity within the Salaries and Expenses account will fund the acquisition of the NII technology and operations and maintenance (O&M) of NII and radiation detection equipment[4]. The FY 2017 President's Budget proposed moving most DHS discretionary accounts to a Common Appropriations Structure beginning in FY 2017, as such the portion of NII technology funds currently dedicated to acquisition will align to the CBP Procurement, Construction, and Improvement Appropriations account, and funds aligned to O&M will align to the CBP Operations and Support Appropriations account.

Table 5 shows the FY 2016 enacted appropriations and FY 2017 President Budget. FY 2018 – FY 2021 budget plans for NII technology acquisition, operations and maintenance are not included within this plan.

[4] The DHS Domestic Nuclear Detection Office acquires CBP's stand-alone radiation detection equipment.

Table 5: NII System Funding Sources ($ in millions)		
	FY 2016[2]	**FY 2017**
NII Technology Acquisition	$90.26	$54.82
NII Operations and Maintenance[5]	$119.01	$118.97
NII Appropriations	**$209.27**	**$173.79**

B. NII Technology Procurement Needs

Table 6 describes the FY 2016 – FY 2021 procurement needs for NII technology based on the FY 2016 enacted appropriations and the FY 2017 President's Budget. FY 2018 – FY 2021 NII technology procurement needs are based on NII technology lifecycle cost estimates; lifecycle cost estimates are routinely evaluated and revised based on realized program costs, emerging requirements and funding profiles. Out-year procurements needs are spread over the years to facilitate a consistent flow of equipment deployments with a constant set of resources, and to allow for a sustainable vendor production capability. Actual procurements are based on available funds and emerging operational requirements.

Table 6: NII Technology Procurement Needs[6] – Unit Quantity							
LS NII Technology	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**	**FY21**	**Total Systems**
High-Energy Rail	1	4	4	2	6	3	**20**
Multi-Energy Fixed	0	2	7	1	3	6	**19**
Low-Energy Fixed	2	1	13	0	0	4	**20**
Medium-Energy Mobile	23	4	11	0	21	14	**73**
Low-Energy Mobile	2	6	2	0	4	2	**16**
New Requirements							
High-Energy Rail	0	1	1	0	0	0	**2**
Multi-Energy Fixed	0	1	1	2	0	0	**4**
Low-Energy Fixed	7	2	5	4	0	0	**18**
Medium-Energy Mobile	0	1	0	0	0	0	**1**
Low-Energy Mobile	1	0	0	0	0	0	**1**
Total LS Technology	**36**	**22**	**44**	**9**	**34**	**29**	**174**
SS NII Systems	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**	**FY21**	**Total Systems**
X-Ray Van	10	8	18	1	11	8	**56**
X-Ray Systems	29	20	40	17	22	30	**158**

[5] NII Operations and Maintenance funding includes operations and maintenance for radiation detection equipment post one-year of deployment.
[6] Procurement quantities are subject to change on the basis of available funds and emerging field requirements.

Table 6: NII Technology Procurement Needs[6] – Unit Quantity							
Density Meter	220	131	492	285	418	241	**1,787**
Fiberscope	0	0	25	25	50	50	**150**
Mobile Ramp	0	12	0	0	0	0	**12**
Survey Meter	20	0	0	0	0	0	**20**
Tool Truck	7	0	12	0	2	2	**23**
Explosive/Chemical Trace	0	0	45	30	45	17	**137**
New Requirements							
X-Ray Van	1	0	0	0	1	2	**4**
X-Ray Systems	9	2	2	0	1	1	**15**
Density Meter	298	37	34	0	37	54	**460**
Videoscope	0	25	23	0	22	22	**92**
Tool Truck	2	2	0	0	2	3	**9**
Total SS NII	**596**	**237**	**691**	**358**	**611**	**430**	**2,923**

V. Conclusion

NII systems play a vital role in helping DHS achieve the goals of safeguarding the global trade and travel systems. On the basis of today's NII technology needs, threat posture, planned budget and cost estimates, the procurement needs described in this multi-year investment and management plan sustains an effective NII technology inventory, and allows CBP to address existing operational requirements. CBP and its mission partners will continue to evaluate its enforcement and acquisition strategies using current and next-generation NII technology to ensure maximum effectiveness and efficiencies across scanning operations. CBP will continue to replace aging systems with current and improved technology to ensure security gaps are not introduced into the architecture. CBP will continue to work with stakeholders to manage inspection and detection technology capabilities to support border security operations.