Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army											Date: May 2017	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603606A *I Landmine Warfare and Barrier Advanced Technology*							
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	-	13.425	17.451	17.948	-	17.948	13.097	13.232	13.908	14.095	-	-
608: *Countermine & Bar Dev*	-	11.518	15.465	15.957	-	15.957	11.104	11.238	11.873	12.018	-	-
683: *Area Denial Sensors*	-	1.907	1.986	1.991	-	1.991	1.993	1.994	2.035	2.077	-	-

A. Mission Description and Budget Item Justification

This Program Element (PE) matures and demonstrates sensors, subsystems and neutralization technologies that can be used by dismounted forces as well as ground and air platforms to detect, identify and mitigate the effects of landmines, improvised explosive devices, minefields, and other explosive hazards. This PE also conducts modeling and simulation activities to assess the effectiveness of detection and neutralization concepts. Project 608 supports the maturation and demonstration of enabling component and subsystems for counter explosive hazards and countermine technologies in the areas of countermine and barrier development and Project 683 funds efforts on area denial sensors.

Work in this PE is fully coordinated with PE 0602120A (Sensors and Electronic Survivability), PE 0602622A (Chemical, Smoke and Equipment Defeating Technology), PE 0602624A (Weapons and Munitions Technology), PE 0602712A (Countermine Systems), PE 0602784A (Military Engineering Technology), PE 0603004 (Weapons and Munitions Advances Technologies), PE 0603270 (Electronic Warfare Technology) and PE 0603710A (Night Vision Advanced Technology).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy.

Work in this PE is performed by the United States (U.S.) Army Communications-Electronics Research, Development and Engineering Center (CERDEC)/Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, VA.

B. Program Change Summary ($ in Millions)	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**
Previous President's Budget	13.966	17.451	18.659	-	18.659
Current President's Budget	13.425	17.451	17.948	-	17.948
Total Adjustments	-0.541	0.000	-0.711	-	-0.711
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.541	-			
• Adjustments to Budget Years	0.000	0.000	-0.750	-	-0.750

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army					Date: May 2017
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 3: *Advanced Technology Development (ATD)*		R-1 Program Element (Number/Name) PE 0603606A *I Landmine Warfare and Barrier Advanced Technology*			
• Civ Pay Adjustments	0.000	0.000	0.039	-	0.039

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603606A / *Landmine Warfare and Barrier Advanced Technology*	Project (Number/Name) 608 / *Countermine & Bar Dev*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
608: *Countermine & Bar Dev*	-	11.518	15.465	15.957	-	15.957	11.104	11.238	11.873	12.018	-	-

A. Mission Description and Budget Item Justification

This Project matures and demonstrates technologies for finding and neutralizing explosive hazards in varying vegetation, soil, and weather conditions at varying times of day. Activities include standoff and close-in detection and neutralization of explosive threats with technology integrated onto both air and ground platforms and in dismounted operations. Efforts are supported by modeling and simulation assessments to define potential system effectiveness.

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by the United States (U.S.) Army Communications-Electronics Research, Development and Engineering Center (CERDEC)/Night Vision and Electronic Sensors Directorate (NVESD), Ft. Belvoir, VA. Minefield neutralization efforts are closely coordinated with Navy/Marine Corps.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: Ground Vehicle Explosive Hazard Detection	11.518	15.465	15.957
Description: This project improves detection, marking, and defeat of low metal/low contrast explosive threats buried in the road and along the sides of roads, Improvised Explosive Devices (IEDs) and antitank landmines. It also matures technologies to increase standoff detection and defeat distances, both in roads and off routes, enabling faster rates of advance and safer operations for early entry and route clearance missions.			
FY 2016 Accomplishments: Matured target detection algorithms for digital ground penetrating radar (GPR) array for identification of explosive hazards in roads and for precision marking; matured forward looking electro-optical / infrared (EO/IR) sensor suite with optimized spatial and spectral resolutions, multi-step target detection algorithms and automated decision making tools to provide integrated capabilities; integrated EO/IR and GPR sensors data and analysis architectures to fuse target nominations from the standoff and localization sensors into a Graphical User Interface (GUI); demonstrated Light Detection and Ranging (LIDAR) sensor to image and identify side attack targets and threats and base lined target detection algorithms to detect road side explosive hazards.			
FY 2017 Plans: Will integrate optimized forward looking EO/IR sensor suite with multi-step target detection algorithms and automated decision making tools to provide a robust vehicle mounted technology demonstrator; finalize forward looking EO/IR to down looking GPR sensor cueing architectures and software to fuse target nominations from the standoff and localization sensors into a GUI;			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603606A / *Landmine Warfare and Barrier Advanced Technology*	**Project (Number/Name)** 608 / *Countermine & Bar Dev*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
integrate LIDAR sensor to image and identify side attack targets and threats onto vehicle testbed; and optimize target detection algorithms to detect road side explosive hazards. ***FY 2018 Plans:*** Will demonstrate and evaluate an integrated forward looking EO/IR sensor suite with multi-step target detection algorithms and automated decision making tools in relevant outdoor environments; demonstrate real-time on-the-move forward looking EO/IR to down looking GPR sensor cueing with integrated graphical user interface; demonstrate and evaluate LIDAR sensor capability to identify side attack targets using vehicle test bed; validate optimized target detection algorithms to detect in-road and road side explosive hazards.			
Accomplishments/Planned Programs Subtotals	11.518	15.465	15.957

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 3	R-1 Program Element (Number/Name) PE 0603606A / *Landmine Warfare and Barrier Advanced Technology*	Project (Number/Name) 683 / *Area Denial Sensors*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
683: *Area Denial Sensors*	-	1.907	1.986	1.991	-	1.991	1.993	1.994	2.035	2.077	-	-

A. Mission Description and Budget Item Justification

This Project matures and demonstrates surveillance and command, and control technology components for anti-access area denial systems that inform maneuver elements and minimize the risk to non-combatants from exposure to anti-personnel landmines (APLs). The technology includes distributed personnel surveillance systems and command and control systems to be used with human-in-the-loop threat confirmation. This Project uses modeling and simulation to evaluate new concepts and doctrine. This Project also fabricates components and system architectures, and it conducts evaluations in field settings.

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by the United States (U.S.) Army Communications-Electronics Research, Development and Engineering Center (CERDEC)/Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, VA.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: Area Denial Sensors	1.907	1.986	1.991
Description: This effort matures and demonstrates networked sensor and sensor fusion technology efforts to provide detection, identification, and classification of remotely delivered sensor systems and area denial munitions. Key technologies to be matured and demonstrated include deployable multi-mode sensors, fused sensor information, and local area network communications to meet requirements for human-in-the-loop command and control.			
FY 2016 Accomplishments: Matured deployable multi-mode sensor architecture that can be integrated into remote delivery munitions, focusing on harsh shock environments; and matured sensor fusion technologies to provide operator management of many remotely employed multi-mode sensor nodes to provide situational awareness and area denial effects.			
FY 2017 Plans: Will mature and demonstrate a hand emplaced sensor system that captures relevant threat signatures to increase probability of detection and decrease false alarms; will optimize sensor fusion technologies to provide operator management of multiple remotely employed sensor nodes to provide situational awareness and area denial effects.			
FY 2018 Plans:			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 3	**R-1 Program Element (Number/Name)** PE 0603606A / *Landmine Warfare and Barrier Advanced Technology*	**Project (Number/Name)** 683 / *Area Denial Sensors*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Will demonstrate scatterable deployed sensor fields, develop image and data processing techniques to improve data management to decision cycle time; demonstrate sensor target data connection to fire control, optimize sensor performance and coordinate interfaces with Fires elements.			
Accomplishments/Planned Programs Subtotals	1.907	1.986	1.991

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A