Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*					R-1 ITEM NOMENCLATURE PE 0603606A: *Landmine Warfare and Barrier Advanced Technology*						
COST ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**Cost To Complete**	**Total Cost**
Total Program Element	35.765	26.953	31.541	-	31.541	31.566	32.546	33.661	33.806	Continuing	Continuing
608: *COUNTERMINE & BAR DEV*	24.601	22.022	26.530	-	26.530	26.474	27.362	28.394	28.449	Continuing	Continuing
64C: *COUNTERMINE DEMONSTRATIONS (CA)*	6.447	-	-	-	-	-	-	-	-	Continuing	Continuing
683: *Area Denial Sensors*	4.717	4.931	5.011	-	5.011	5.092	5.184	5.267	5.357	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element (PE) matures and demonstrates sensor and neutralization technologies that can be used on ground and/or air platforms to detect, identify, and then mitigate the effects of landmines, minefields, and obstacles. 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 countermine technologies in the areas of countermine and barrier development, Project 64C funds congressional special interest items, and Project 683 funds efforts on area denial sensors.

Work in this PE is fully coordinated with PE 0602120A (Sensors and Electronic Survivability), PE 0602624A (Weapons and Munitions Technology), PE 0602712A (Countermine Systems), PE 0602784A (Military Engineering Technology) and PE 0603710A (Night Vision Advanced Technology).

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this PE is performed by the Army Research, Development, and Engineering Command (RDECOM)/Communications-Electronics Research, Development, and Engineering Center (CERDEC), Fort Belvoir, VA.

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APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*			R-1 ITEM NOMENCLATURE PE 0603606A: *Landmine Warfare and Barrier Advanced Technology*		
B. Program Change Summary ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**
Previous President's Budget	34.855	26.953	32.791	-	32.791
Current President's Budget	35.765	26.953	31.541	-	31.541
Total Adjustments	0.910	-	-1.250	-	-1.250
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	1.751	-			
• SBIR/STTR Transfer	-0.841	-			
• Adjustments to Budget Years	-	-	-1.250	-	-1.250

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603606A: *Landmine Warfare and Barrier Advanced Technology*	PROJECT 608: *COUNTERMINE & BAR DEV*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
608: *COUNTERMINE & BAR DEV*	24.601	22.022	26.530	-	26.530	26.474	27.362	28.394	28.449	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project matures and demonstrates countermine technologies for finding and neutralizing surface and buried threats in varying vegetation, soil, weather, and diurnal conditions. Activities include remote/standoff detection of minefields and neutralization of explosive threats, landmines, and minefields. This project also evaluates airborne threat detection sensors and fabricates them for lightweight plug-and-play use, on unmanned aerial systems (UASs) in mission specific applications. Efforts are supported by modeling and simulation assessments to define potential system effectiveness.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this project is performed by the Army Research, Development, and Engineering Command (RDECOM)/Communications-Electronics Research, Development, and Engineering Center (CERDEC), Ft. Belvoir, VA. Minefield neutralization efforts are closely coordinated with Navy/US Marine Corps.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Threat Detection and Neutralization for Route Clearance:	10.316	10.365	8.418
Description: This effort demonstrates capabilities to detect and neutralize surface and shallow buried threats on primary and secondary roads from tactical standoff ranges.			
FY 2010 Accomplishments: Demonstrated standoff detection system integration concepts on manned ground vehicles; matured electro optic/infrared (EO/IR) graphical user interface (GUI) algorithms to improve system performance; matured radar fusion algorithms to reduce false alarms; and improved performance of grenade shape charge munitions from PE 0602712A, project H24 for standoff explosive threat neutralization capability.			
FY 2011 Plans: Complete fabrication of prototypes for the standoff detection and standoff neutralization grenade technologies; and perform tests and conduct demonstrations of the brassboards for the standoff detection and standoff neutralization grenade technologies as systems-of-systems concepts.			
FY 2012 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603606A: *Landmine Warfare and Barrier Advanced Technology*	PROJECT 608: *COUNTERMINE & BAR DEV*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Will conduct trade studies to establish system level options for neutralization of individual explosive devices and for mine fields; will validate emerging high energy laser techniques to neutralize individual explosive hazards; will substantiate evolving burst laser techniques to neutralize threats detected by primary sensors.			
Title: Mine and Minefield Detection Payload for Tactical Unmanned Aerial Systems (TUAS): ***Description:*** This effort provides the TUAS with a capability to detect explosive threats, threat deployment activity, minefields and homemade explosives (HME). ***FY 2010 Accomplishments:*** Performed flight testing/data collections on manned aircraft; matured algorithms based on sensor data collections and analysis; and completed detailed payload design. ***FY 2011 Plans:*** Complete demonstrator payload build and sensor integration; complete laboratory evaluation of payload; integrate payload on a manned aircraft; conduct initial flight testing in a relevant environment to baseline payload and target detection performance; and complete the payload and begin testing to verify performance. ***FY 2012 Plans:*** Will integrate shortwave infrared (SWIR) into initial payload and integrate the payload on a manned aircraft; will complete baseline aided target recognition (AiTR) integration and conduct initial flight testing in a relevant environment to baseline payload and AiTR detection performance; will optimize payload from test data, perform final verification testing, specify and initiate build of a 3-band longwave infrared (LWIR) demonstrator; perform system design trade studies; conduct concept evaluation exercise with representative sensors.	8.165	5.047	8.402
Title: Threat/Mine Detection for In Road Obstacles: ***Description:*** This effort advances ground penetrating radar (GPR) and metal detection (MD) technologies integrated onto vehicles to detect the evolving underbelly threats on primary and secondary roads. This effort leverages the technology results from forward looking radar technology investigations under the Threat Detection and Neutralization for Route Clearance effort. ***FY 2010 Accomplishments:*** Completed GPR demonstration; began integration of a combined MD and GPR sensor suite which includes a modular lightweight mount to interface with tactical ground vehicles; and began fabrication of combined metal detection/GPR sensor. ***FY 2011 Plans:***	6.120	6.610	9.710

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603606A: *Landmine Warfare and Barrier Advanced Technology*	PROJECT 608: *COUNTERMINE & BAR DEV*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Complete fabrication of system demonstrators for the integrated MD/GPR detection technologies; perform tests and conduct demonstrations of a MD/GPR system on a manned ground vehicle. ***FY 2012 Plans:*** Will perform size, weight and power (SWaP) analysis and system tradeoff studies for potential sensor payloads for the Pointer Upgraded Mission Ability Unmanned Aerial Vehicle (PUMA UAV) and evaluate complimentary sensors for a ground-based platform; will design a 3-band imaging sensor compatible with a forward motion compensation pointer; will evaluate aided target recognition approaches for compatibility with selected sensors; will conduct concept evaluation exercises of representative air and ground-based sensors using mission scenarios in a relative environment.			
Accomplishments/Planned Programs Subtotals	24.601	22.022	26.530

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603606A: *Landmine Warfare and Barrier Advanced Technology*	PROJECT 64C: *COUNTERMINE DEMONSTRATIONS (CA)*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
64C: *COUNTERMINE DEMONSTRATIONS (CA)*	6.447	-	-	-	-	-	-	-	-	Continuing	Continuing

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Countermine advanced technology development.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Advanced Demining Technology ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Provided a suite of robotic and intelligent systems to aid humanitarian efforts in all aspects of landmine and unexploded ordinance (UXO) clearance.	4.696	-	-
Title: Ultra Wideband Active RF Detection of IEDs ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Developed a sensor capability for ground looking RF detection and real-time discrimination of IED detection.	1.751	-	-
Accomplishments/Planned Programs Subtotals	6.447	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603606A: *Landmine Warfare and Barrier Advanced Technology*	PROJECT 683: *Area Denial Sensors*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
683: *Area Denial Sensors*	4.717	4.931	5.011	-	5.011	5.092	5.184	5.267	5.357	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project matures and demonstrates surveillance, command, and control technology components for alternative area protection systems that minimize the risk of injury or loss 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 man-in-the-loop overwatch fires. This project uses modeling and simulation to evaluate new concepts and modify doctrine. This project also fabricates components, as well as system architectures and conducts evaluations at the system level in field settings.

The cited work is consistent with the Director, Defense Research and Engineering Strategic Plan, the Army Modernization Strategy, and the Army Science and Technology Master Plan.

Work in this project is performed by the Army Research, Development, and Engineering Command (RDECOM)/Communications-Electronics Research, Development, and Engineering Center (CERDEC), Fort Belvoir, VA.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Area Denial Sensors:	4.717	4.931	5.011
Description: This effort provides demonstration of surveillance technology components for area protection systems that minimize the risk of injury or loss to non-combatants from exposure to anti-personnel landmines (APLs). ***FY 2010 Accomplishments:*** Continued advancement of personnel detection sensors and algorithm demonstrations in laboratory environment; established and assessed concepts on how to use the sensors with alternative personnel landmine systems. ***FY 2011 Plans:*** Fabricate sensor hardware and integrate algorithms into demonstrators; and conduct initial laboratory tests in a simulated relevant environment of next generation sensor and discrimination system. ***FY 2012 Plans:*** Will continue the maturation and demonstration of the personnel detection system in an operationally relevant environment; and will validate the detection system components and sensor algorithm for the sensor detection and discrimination of combatants/ non-combatants, and image processing for false alarm reduction.			
Accomplishments/Planned Programs Subtotals	4.717	4.931	5.011

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603606A: *Landmine Warfare and Barrier Advanced Technology*	PROJECT 683: *Area Denial Sensors*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Book, dated May 2010.