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 0603734A: *Military Engineering 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	40.423	27.393	36.516	-	36.516	30.708	26.403	23.335	23.521	Continuing	Continuing
T08: *COMBAT ENG SYSTEMS*	5.843	27.393	36.516	-	36.516	30.708	26.403	23.335	23.521	Continuing	Continuing
T13: *Stationary Power & Energy Tech Demonstrations (CA)*	27.417	-	-	-	-	-	-	-	-	Continuing	Continuing
T15: *MILITARY ENGINEERING TECHNOLOGY DEMONSTRATION (CA)*	7.163	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

FY10 funding realigned to higher priority efforts.

A. Mission Description and Budget Item Justification

This program element (PE) matures and demonstrates advanced military engineering and geospatial research and engineering technologies. Military engineering technologies include individual, group and asset protection such as overhead cover, structures, protective shields, barriers, and deployable force protection (DFP) to combat highly adaptive and increasingly severe threats (Project T08). Project T08 also funds geospatial research and engineering technologies including sensing systems and mapping tools that enable the Warfighter to understand the impact of the terrain and weather effects during planning and execution of military operations. Geospatial research and engineering also provides and optimizes decision aids and geospatial products that support network centric delivery and update of geospatial data and services to all echelons for battle command planning and mission rehearsal.

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.

This work is fully coordinated with and complementary to PE 0602784A (Military Engineering Technology). DFP activities are coordinated with US Army Research Development and Engineering Command, the Defense Advanced Research Projects Agency, and the Services.

Work in this PE is led, managed or performed by the US Army Engineer Research and Development Center, Vicksburg, MS.

Projects T13 and T15 fund Congressional Interest Items.

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 0603734A: *Military Engineering 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	45.394	27.393	35.016	-	35.016
Current President's Budget	40.423	27.393	36.516	-	36.516
Total Adjustments	-4.971	-	1.500	-	1.500
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-4.934	-			
• SBIR/STTR Transfer	-0.037	-			
• Adjustments to Budget Years	-	-	1.500	-	1.500

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 0603734A: *Military Engineering Advanced Technology*	PROJECT T08: *COMBAT ENG SYSTEMS*	

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
T08: *COMBAT ENG SYSTEMS*	5.843	27.393	36.516	-	36.516	30.708	26.403	23.335	23.521	Continuing	Continuing

Note

not applicable for this item

A. Mission Description and Budget Item Justification

This program element (PE) matures and demonstrates advanced military engineering and geospatial research and engineering technologies. Military engineering technologies demonstrated include individual, group and asset protection such as overhead cover, structures, protective shields, barriers, and deployable force protection (DFP) to combat highly adaptive and increasingly severe threats through integration, demonstrations, and red teaming. DFP activities are focused on solving critical gaps in protecting forces operating at smaller, remote bases. Geospatial research and engineering technologies demonstrated include Battlespace Terrain Reasoning and Awareness (BTRA) and Collaborative Battlespace Reasoning and Awareness (COBRA), which was titled Joint-Geospatial Enterprise Services (J-GES) in FY09 and FY10, technologies. BTRA enables the Warfighter to understand the impact of the terrain and weather effects during planning and execution of military operations. The COBRA program matures and demonstrates technology that supports network centric delivery and update of geospatial data and services to all echelons for battle command planning and mission rehearsal. Objectives include novel detection methods for persistent surveillance and applying Civil Military Operations algorithms addressing interrelationship between human and physical terrain.

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.

This work is fully coordinated with and complementary to PE 0602784A (Military Engineering Technology). DFP activities are coordinated with US Army Research Development and Engineering Command, the Defense Advanced Research Projects Agency, and the Services.

Work in this project is led, managed or performed by the US Army Engineer Research and Development Center, Vicksburg, MS. The work in deployable force protection is coordinated with US Army Research Development and Engineering Command, the Defense Advanced Research Projects Agency, and the Services.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Collaborative Battlespace Reasoning and Awareness (COBRA)	1.113	1.201	4.262
Description: This effort develops capabilities including multi-platform, cross-community applications and software services that support the integration and synchronization of intelligence and operations functions; these capabilities will enable Battle Command unification and result in faster and higher quality decision cycles through collaboration and real-time sharing, exploitation, and analysis to support the operational mission, tasks, and desired effects. This effort was titled Joint-Geospatial Enterprise Services in FY09 and FY10 and is renamed to better reflect actual activities.			

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 0603734A: *Military Engineering Advanced Technology*	PROJECT T08: *COMBAT ENG SYSTEMS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Conducted evaluations to assess geospatial data and information requirements for users and evaluated trade-offs with regard to force structure, location and storage of geospatial data and information, available bandwidth, and computation resources across the network. ***FY 2011 Plans:*** Develop multi-platform, cross-community applications and services, collaboration services, decision support tools, and Commercial/Joint Mapping Tool Kit (CJMTK) enhancements. ***FY 2012 Plans:*** Will demonstrate, evaluate and validate multi-platform, cross-community applications and services for transition to users, including CJMTK.			
Title: Battlespace Terrain Reasoning and Awareness - Battle Command (BTRA-BC) ***Description:*** This effort develops software analytics and decision tools that capture integrated terrain and weather effects; investigates and develops predictive decision tools to exploit those products; these systems provides information that empowers commanders, Soldiers, and systems to understand and incorporate the impacts of terrain and weather on their functional responsibilities and processes. ***FY 2010 Accomplishments:*** Successfully demonstrated unified net-centric data strategies within common architecture and framework across Intelligence, Operations, and Geospatial communities; successfully concluded in FY10 and resulted in spiral transitions to CJMTK; Distributed Common Ground System; North Atlantic Treaty Organization; Environmental Systems Research Institute Defense Core; and the US Air Force.	4.730	-	-
Title: Common Ground JCTD ***Description:*** The effort designs and develops common geospatial enterprise software components that operationally unify and extend current US and Coalition command and control data, information architectures and systems; this effort will result in increased quality and agility of Service, Joint and Coalition Battle Command through Common Operating Environment Awareness. ***FY 2011 Plans:*** Create a doctrinally based Coalition Operation Management Language for precision indexing to the Joint Command Control and Communications Information Exchange Data Model and geospatial products, creating commonality between command and control and simulations.	-	3.064	-
Title: Defeat of Emerging Adaptive Threats	-	2.628	4.254

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 0603734A: *Military Engineering Advanced Technology*	PROJECT T08: *COMBAT ENG SYSTEMS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Description: This effort investigates, validates, and matures components of protective systems to combat highly adaptable and increasingly severe threats to save lives of Warfighters and also increase the survivability of fixed facilities and critical assets. ***FY 2011 Plans:*** Evaluate and validate novel layered protective systems incorporating multiple defeat mechanisms for the mitigation of blast, ballistic, and debris impact effects. ***FY 2012 Plans:*** Will demonstrate and validate performance of novel layered protective systems under live-fire tests in realistic environments; mature components, fabricate prototypes, optimize implementation, and establish initial fielding of protective systems to defeat large-caliber rockets, vehicle born improvised explosive devices (IED), human born IEDs, and shoulder-fired rockets.			
Title: Deployable Force Protection Technology Integration Demonstrations and Red Teaming ***Description:*** This work matures and demonstrates technologies for rapidly deployable force protection for smaller bases operating remotely or integrated with local communities but with a less overt security posture. This effort begins to fill a significant gap in force protection capabilities. This work is fully coordinated with PE0602784A/T40 and T41, Deployable Force Protection, PE0603313A/G03, PE 0602786A, and PE 0603125A. ***FY 2011 Plans:*** Identify critical force protection gaps and select most promising technology enabled solutions to detect, assess, and defend assets and personnel operating at smaller, remote bases including active and passive protection; fabricate sub and full-scale pre-prototypes for these solutions; assess performance of selected systems in asymmetric and other relevant environments utilizing red and blue teaming; develop and validate models and software; begin evaluation of integration of technologies. ***FY 2012 Plans:*** Will identify critical force protection gaps and down select most promising technology enabled solutions to advance active and passive protection, detection and assessment; will improve designs to reduce key factors such as size and/or weight, power and energy, manpower, and support requirements and to enhance performance of systems; will integrate capabilities based on stakeholder priorities; will continue to conduct full-scale demonstrations and user assessments and conduct red and blue team missions in asymmetric and other relevant environments to identify further areas for improving robustness of design and implementation and to increase systems effectiveness.	-	20.500	28.000
Accomplishments/Planned Programs Subtotals	5.843	27.393	36.516

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 0603734A: *Military Engineering Advanced Technology*	PROJECT T08: *COMBAT ENG SYSTEMS*

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 0603734A: *Military Engineering Advanced Technology*	PROJECT T13: *Stationary Power & Energy Tech 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
T13: *Stationary Power & Energy Tech Demonstrations (CA)*	27.417	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

Congressional special interest projects to mature and demonstrate advanced military engineering and geospatial research and engineering technologies.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Gas Engine Driven Air Conditioning Demonstration (GEDAC): ***Description:*** This is a Congressional Interest Item ***FY 2010 Accomplishments:*** Completed field test and demonstration of commercialized 11-ton gas engine driven heat pumps, and prototype 5-ton dark start gas engine driven heat pump/generator units in DoD installations.	2.387	-	-
Title: Advanced Tactical Fuels for the Military ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Developed technologies for hydrogen and hydrocarbon fuels production for use by the U.S. military. Using JP-8 and renewable feedstock's, hydrogen was produced for use in fuel cells that drive vehicles or provide auxiliary or primary distributed power.	3.183	-	-
Title: Multi-Campus Base Facility Energy Independence: ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Demonstrated energy integration of three Ohio Army National Guard campuses for improved internal base energy security and increase cost savings.	3.183	-	-
Title: Quiet, Low-Impact Alternative Energy Technology ***Description:*** This is a Congressional Interest Item.	1.990	-	-

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 0603734A: *Military Engineering Advanced Technology*	PROJECT T13: *Stationary Power & Energy Tech Demonstrations (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Evaluated performance and durability of the ammonia and urea electrolyzers of 1KW prototype.			
Title: Natural Gas Firetube Boiler Demonstration ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Retrofitted and demonstrated a new combined water and heat fire tube boiler reclamation system (Super Boiler) with 15% higher efficiency.	0.796	-	-
Title: Demonstration of Thin Film Solar Modules as a Renewable Energy Source ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Installed and demonstrated a state of the art modular thin film solar photovoltaic array at an Army installation.	0.796	-	-
Title: Amorphous Si Flexible Photovoltaics for Grid Parity ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Developed and demonstrated a high speed manufacturing process for low cost building integrated photovoltaic systems.	1.592	-	-
Title: Hybrid Energy Systems Design and Testing ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Assessed the technical and operational feasibility of deploying a next-generation hybrid energy system on a US Army installation to combine traditional fossil fired power with available renewable energy sources.	1.990	-	-
Title: Zinc Flow Electrical Energy Storage ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Installed and demonstrated a flow battery electrical storage unit at an Army installation.	1.990	-	-
Title: Integrated Alternative Power Systems	2.069	-	-

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 0603734A: *Military Engineering Advanced Technology*	**PROJECT** T13: *Stationary Power & Energy Tech Demonstrations (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Description: This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Developed and demonstrated a comprehensive power management system to integrate wind and solar power supplies into the current infrastructure including utility and legacy backup generation.			
Title: Pacific Command Renewable Energy Security System ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Developed and operated a sustainable system to demonstrate how the Army can grow its own fuel on its own designated lands.	2.387	-	-
Title: Conversion of Municipal Solid Waste to Renewable Diesel Fuel ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Continued the waste to diesel fuel plant demonstration to include a set of trials with various waste inputs, and laboratory analyses of fuel output.	2.507	-	-
Title: Internal Base Facility Energy Independence ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Demonstrated the use of alternative fuel sources to power structures located on Military bases to enhance facility operations and management, improve internal base energy security and increase cost savings.	2.547	-	-
Accomplishments/Planned Programs Subtotals	27.417	-	-

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 0603734A: *Military Engineering Advanced Technology*	PROJECT T15: *MILITARY ENGINEERING TECHNOLOGY DEMONSTRATION (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
T15: *MILITARY ENGINEERING TECHNOLOGY DEMONSTRATION (CA)*	7.163	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

These are Congressional Interest Items for Military Engineering Technology Demonstrations.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Lightweight Protective Roofing ***Description:*** This is a Congressional Interest Item ***FY 2010 Accomplishments:*** Investigated lightweight side wall panels for protection against both blast and fragments. This technology was transitioned to roofing components with enhanced ductility and energy absorption, providing protection from top attack munitions.	1.193	-	-
Title: Nanotechnology for Potable Water and Waste Treatment ***Description:*** This is a Congressional Interest Item ***FY 2010 Accomplishments:*** Designed and benchmark-tested low cost multifunctional nanomaterials to effectively purify water for potable supply and mitigate waterborne contaminants.	1.592	-	-
Title: University Center for Disaster Preparedness and Emergency Response ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Continued support of the Rutgers University Center.	1.194	-	-
Title: Enhancing the Commercial Joint Mapping Toolkit to Support Tactical Military Operations ***Description:*** This is a Congressional Interest Item.	3.184	-	-

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 0603734A: *Military Engineering Advanced Technology*	PROJECT T15: *MILITARY ENGINEERING TECHNOLOGY DEMONSTRATION (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Provided common tools to support spatially based prediction and projection of entities within a Joint Operating Environment.			
Accomplishments/Planned Programs Subtotals	7.163	-	-

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.