Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Army										DATE: February 2012	
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 2011**	**FY 2012**	**FY 2013 Base**	**FY 2013 OCO**	**FY 2013 Total**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**Cost To Complete**	**Total Cost**
Total Program Element	23.617	36.458	28.458	-	28.458	24.198	21.354	21.397	21.669	Continuing	Continuing
T08: *COMBAT ENG SYSTEMS*	23.617	36.458	28.458	-	28.458	24.198	21.354	21.397	21.669	Continuing	Continuing

Note

FY 11 decrease attributed to $3 million Congressional reduction for Deployable Force Protection

A. Mission Description and Budget Item Justification

This program element (PE) matures and demonstrates data and information architectures and software applications, as well as sensing systems, that can be used to provide Warfighters with timely, accurate, easily interpretable data and information for the operational and tactical mission environments, focusing physical and human terrain and weather; methodologies, software applications and hardware for improving ground vehicle mobility and countermobility to support ground force operations, including force projection; components, subsystems, and systems to increase the survivability of personnel, critical assets, and facilities through structures, shields, and barriers to combat highly adaptive and increasingly severe threats; and components, systems, and interoperable systems of systems for detecting threats, assessing situations, defending against threats, and communicating information and warnings for deployable force protection.

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

This work is fully coordinated with and complementary to PE 0602784A (Military Engineering Technology). Deployable force protection activities are coordinated with research, development and engineering centers and laboratories across the US Army, Navy and Air Force.

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

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B. Program Change Summary ($ in Millions)	**FY 2011**	**FY 2012**	**FY 2013 Base**	**FY 2013 OCO**	**FY 2013 Total**
Previous President's Budget	27.393	36.516	30.708	-	30.708
Current President's Budget	23.617	36.458	28.458	-	28.458
Total Adjustments	-3.776	-0.058	-2.250	-	-2.250
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.557	-			
• Adjustments to Budget Years	-	-	-2.250	-	-2.250
• Other Adjustments 1	-3.000	-0.058	-	-	-
• Other Adjustments 2	-0.219	-	-	-	-

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COST ($ in Millions)	FY 2011	FY 2012	FY 2013 Base	FY 2013 OCO	FY 2013 Total	FY 2014	FY 2015	FY 2016	FY 2017	Cost To Complete	Total Cost
T08: *COMBAT ENG SYSTEMS*	23.617	36.458	28.458	-	28.458	24.198	21.354	21.397	21.669	Continuing	Continuing

Note

not applicable for this item

A. Mission Description and Budget Item Justification

This project matures and demonstrates software and architectures for geospatial mapping applications and decision aids for the Warfighter; components, systems, system of systems and decision aids to enable ground vehicle mobility (freedom of movement), including force projection, countermobility to impede movement of threat forces; survivability and force protection to protect personnel, facilities and assets through design and reinforcement of structures, and deployable force protection to detect, assess, and defend against threats for troops deployed at smaller bases (such as bases being compromised or overrun). Work is in support of current and future ground force operations. Software and architectures for geospatial projects mature and validate geospatial decision tools in support of operations planning and decision making to advance utility for geospatial capability and techniques across the Army, services and coalition and to advance and mature the information architecture that supports the total Army's discovery and access to data, geospatial information and analytical tool suites. Deployable Force Protection (DFP) activities are focused on filling critical gaps in protecting forces operating at smaller, remote bases and include maturation, integration, and demonstration of components, systems and systems of systems for rapidly deployable threat detection in direct line-of-site and non-line-of-site environments; situation assessment to help reduce false alarms and decrease manpower required to monitor the environment; passive protection to mitigate blasts, direct, and indirect fire effects; and active defense to suppress or eliminate threats and threat systems. Work in survivability and force protection also includes maturing and demonstrating software to characterize blast effects generated from explosive events, such as improvised explosive device detonation in soils, and support design and decision aids. Work in mobility and force projection includes maturing and demonstrating software and hardware to assess and improve freedom of movement for ground forces.

Work in this project supports the Army S&T Ground, Command, Control, Communications (C3), and Soldier Portfolios.

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

This work is fully coordinated with and complementary to PE 0602784A (Military Engineering Technology). Geospatial activities are coordinated with the National Geospatial Intelligence Agency (NGA).

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 (DFP) is coordinated with research, development and engineering centers and laboratories across the US Army, Navy and Air Force.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Title: Collaborative Battlespace Reasoning and Awareness (COBRA)	1.181	4.255	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
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 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. ***FY 2011 Accomplishments:*** Developed multi-platform, cross-community applications and services, collaboration services, decision support tools, and Commercial/Joint Mapping Tool Kit (CJMTK) enhancements. ***FY 2012 Plans:*** Demonstrate, evaluate and validate multi-platform, cross-community applications and services for transition to users, including CJMTK.			
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 results in increased quality and agility of Service, Joint and Coalition Battle Command through Common Operating Environment Awareness. ***FY 2011 Accomplishments:*** Created 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.	2.944	-	-
Title: Defeat of Emerging Adaptive Threats ***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 Accomplishments:*** Evaluated and validated novel layered protective systems, incorporating multiple defeat mechanisms for the mitigation of blast, ballistic, and debris impact effects. ***FY 2012 Plans:***	2.548	4.247	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
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: Advanced Geospatial Tools and Architectures ***Description:*** This effort matures methods and demonstrates data, information, and software tools and architectures to bring physical and human terrain and effects data into decision frameworks for consistent and accurate implementation in the Army Geospatial Enterprise (AGE). This provides ready-access of low-overhead, light-weight, analytic tools to other services and DoD and increases situational awareness of the operational environment in support of mission planning and operations. ***FY 2013 Plans:*** Will mature and evaluate software algorithms and architectures for humanitarian assistance and disaster response, allowing military support to and incorporation of other nations and organizations into Army and DoD information computing environments; demonstrate appplications of algorithms and architectures with 100% open software and standards; mature and deliver a wiki-like software environment to obtain, authenticate, and share socio-cultural data, information and concepts; develop tools for terrain and cultural feature extraction and begin the data enterprise framework integration; develop a unified sensor coverage framework and adaptive sensor performance assessment for active and passive counter-insurgency defeat tool; mature an optimized, operational pattern analysis tool focusing on physical, social, cultural, adversarial, and friendly datasets.	-	-	3.782
Title: Deployable Force Protection Technology Integration Demonstrations and Red Teaming ***Description:*** This effort matures, integrates and demonstrates rapidly deployable threat detection, situation assessment, passive protection and active defensive technology-enabled capabilities to meet critical capability gaps for troops operating remotely at smaller bases or integrated with local communities. The needs at these smaller bases (less than 300 persons, not all U.S. troops) are unique based on constraints in transportability, manpower, organic resources, lack of hardening of structures, resupply, and training for example. Moreover, lack of interoperability and scaleability consume manpower and take away from time needed to perform missions. Threats include bases being overrun by hostiles; direct fire; rockets, artillery and mortars; and improvised explosive devices. Force protection challenges at these remote, smaller bases include providing increased standoff detection, blast and ballistic protection, and kinetic technologies subject to the constraints mentioned above. This effort begins to fill a significant gap in force protection capabilities. This work is fully coordinated with PE0602784A/T40, Deployable Force Protection; PE 0602786A; PE0603313A/G03; and PE 0603125A. Work is performed by Army, Navy, and Air Force labs and centers. ***FY 2011 Accomplishments:*** Identified critical force protection gaps and selected most promising technology enabled solutions to detect, assess, and defend assets and personnel operating at smaller, remote bases including active and passive protection; fabricated sub and full-scale	16.944	27.956	20.716

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
pre-prototypes for these solutions; assessed performance of selected systems in asymmetric and other relevant environments utilizing red and blue teaming; developed and validated models and software; began evaluation of integration of technologies. ***FY 2012 Plans:*** Identify critical force protection gaps and down select most promising technology enabled solutions to advance active and passive protection, detection and assessment; 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; integrate capabilities based on stakeholder priorities; 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. ***FY 2013 Plans:*** Will complete development of low-logistics, rapidly deployable, overhead cover system for select critical asset protection; demonstrate perimeter standoff enforcement capabilities and entry control point technologies; demonstrate reinforcement of existing structures typical of conditions in operating environments; conduct evaluation of deployable radio frequency direction finding system to locate hostile activity; demonstrate integrated architecture for sensor components/systems; demonstrate enhanced detection capabilities for identifying hostiles; 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.			
Title: Occupant-Centric Survivability ***Description:*** This effort develops a comprehensive model of improvised explosive device (IED) detonations in soils that accurately predicts the blast pressure and fragmentation of IEDs on ground vehicle systems in a wide range of operational environments. This work supports PEs 0633005/221 and 0622601/C05 in collaboration with the Tank and Automotive Research, Development and Engineering Center. ***FY 2013 Plans:*** Will demonstrate advanced numerical methods for coupling occupant response to shock resulting from improvised explosive device (IED) detonations. This work supports PEs 0633005/221 and 0622601/C05 in collaboration with the Tank and Automotive Research, Development and Engineering Center.	-	-	0.694
Title: Rapid Operational Access and Maneuver Support ***Description:*** This effort develops improved means for achieving Force Projection in coastal, estuary and riverine environments and an integrated sensing and simulation system for predicting physical conditions in these operational environments. ***FY 2013 Plans:***	-	-	3.266

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2011	FY 2012	FY 2013
Will demonstrate modular, extensible computational toolkit to rapidly assess throughput and mobility of vehicles at austere and remote sites, including along coasts, estuaries, and rivers via reliable simulation of waves, currents, sediment, and other material transport mechanisms affecting movement/throughput; demonstrate sensor utilization and characterization of operational conditions at austere ports and offload sites for determining infrastructure load carrying capability.			
Accomplishments/Planned Programs Subtotals	23.617	36.458	28.458

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.