Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*				R-1 ITEM NOMENCLATURE PE 0602784A: *MILITARY ENGINEERING 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	60.536	79.189	80.317	-	80.317	78.856	76.249	71.268	70.606	Continuing	Continuing
855: *TOPOGRAPHICAL, IMAGE INTEL & SPACE*	15.261	17.056	17.356	-	17.356	18.336	18.712	19.092	19.429	Continuing	Continuing
H71: *Meteorological Research for Battle Command*	5.627	5.588	6.157	-	6.157	6.298	6.444	6.592	6.742	Continuing	Continuing
T40: *MOB/WPNS EFF TECH*	20.303	31.231	41.052	-	41.052	38.092	34.630	29.722	30.237	Continuing	Continuing
T41: *MIL FACILITIES ENG TEC*	4.369	16.949	7.305	-	7.305	7.576	7.736	6.962	5.146	Continuing	Continuing
T42: *Terrestrial Science Applied Research*	5.491	5.090	5.244	-	5.244	5.348	5.457	5.565	5.660	Continuing	Continuing
T45: *ENERGY TEC APL MIL FAC*	3.237	3.275	3.203	-	3.203	3.206	3.270	3.335	3.392	Continuing	Continuing
T48: *Center for Geosciences & Atmospheric Research*	2.985	-	-	-	-	-	-	-	-	Continuing	Continuing
T53: *Military Engineering Applied Research (CA)*	3.263	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

This program element (PE) investigates, evaluates, and matures military engineering technologies for geospatial, atmospheric, and weather characterization and modeling; force protection; force projection; and sustainable, cost efficient and resilient facilities and bases. Research supports special requirements for battlefield visualization, tactical decision aids, weather intelligence products, and capabilities to exploit space assets. Results are tailored to support the materiel development, testing, and operations communities in evaluating the impacts of weather, terrain, and atmospheric obscurants on military materiel and operations (Project 855 and H71). Major research efforts also focus on advanced technologies for adaptive and expedient force protection across the range of military operations; overcoming battlespace gaps; rapid port enhancement; mobility, survivability, and weapons effects in urban terrain modeling and simulation (Project T40). Research efforts to develop technology-enabled capabilities for deployable force protection to support troops operating at remote bases or integrated with local communities are performed in projects T40 and T41 starting in FY11. Facilities engineering efforts include simulation of infrastructure capabilities for force projection, protection, and readiness to improve the efficiency and cost effectiveness of the training, readiness, and force projection missions in garrison; force sustainment missions in theaters of operation; and critical infrastructure interdependencies (Project T41 and T45). Research in this PE also focuses on impacts of the battlespace environment on platforms, sensors, personnel, and systems (Project T42).

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army	DATE: February 2011
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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). Deployable force protection activities are coordinated with US Army Research Development and Engineering Command, and the Services. Research is transitioned to PE 0603734A (Military Engineering Advanced Technology), PE 0603125A (Combating Terrorism, Technology Development).

The work in this PE is being led, managed or performed by the US Army Engineer Research and Development Center, Vicksburg, MS, and the Army Research Laboratory, Aberdeen Proving Ground, MD.

Projects T48 and T53 fund Congressional Interest Items.

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	60.779	79.189	77.608	-	77.608
Current President's Budget	60.536	79.189	80.317	-	80.317
Total Adjustments	-0.243	-	2.709	-	2.709
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.243	-			
• Adjustments to Budget Years	-	-	2.709	-	2.709

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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
855: *TOPOGRAPHICAL, IMAGE INTEL & SPACE*	15.261	17.056	17.356	-	17.356	18.336	18.712	19.092	19.429	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

This program element (PE) investigates, evaluates, and matures military engineering technologies. This effort provides research for managing, transforming, updating, improving, and disseminating extremely large volumes of terrain and weather effects data at, or near, real-time and dynamic analysis and reasoning of this data to enable future force command and control systems by providing superior knowledge of the battlespace terrain and environment. Work in this project significantly enhances the Army's spatial-temporal data analysis, management and dissemination capabilities. Efforts include developing logical and conceptual models to support Civil Military Operations (CMO), and examining unification of Geospatial Intelligence with environmental and emerging cultural geographical information requirements associated with CMO by extending geospatial tools support to military decision making within stability operation environment.

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 efforts funded in PE 0601102A, Project 52C and PE 0602784A, Project H71.

The work in this project is performed by the US Army Engineer Research and Development Center, Vicksburg, MS.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Terrestrial Data Generation	2.591	-	-
Description: This effort minimizes or eliminates the dramatic effects of dynamically changing terrain states on sensing and maneuver operations conducted by the Army; and provides effective decision-making tools such as models, simulations and mission planning and also rehearsal factors to accurately predict the state of the ground, near-surface atmospheric conditions, and system performance in complex environments. ***FY 2010 Accomplishments:*** Empirically tested optical reporting, or signal emission in the presence of certain target molecules, of remote sensors. In FY11, this research is conducted in task Terrain Analysis for Signal and Signature Phenomenology.			
Title: Data Generation and Management	5.776	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Description: This effort develops and investigates technologies that address Future Force battlespace awareness capability shortfalls, and where feasible, enhances Current Force capabilities through spiral development technology insertions. ***FY 2010 Accomplishments:*** Developed tools and techniques to exploit Buckeye, airborne and terrestrial Light detection and Ranging (LIDAR), and other sensor data, for bare earth digital elevation derivation, automated feature extraction, forest and tree canopy segmentation; modeled extracted data into realistic three-dimensional representations. In FY11, this research is conducted in task Geospatial Infostructure and Framework and task Imagery and GeoData Sciences.			
Title: Data Analysis ***Description:*** This effort develops analytic and decision support tools that provide actionable information of terrain, atmospheric and weather impacts on units, systems, platforms and soldiers to support Battle Command and Intelligence, Surveillance and Reconnaissance decision making. ***FY 2010 Accomplishments:*** Evolved evidential reasoning model(s) from standalone to reach back services. In FY11 research is conducted in task Geospatial Reasoning, task Geoenabled Battle Command, and task Geospatial Infostructure and Framework.	6.894	-	-
Title: Terrain Analysis for Signal and Signature Phenomenology ***Description:*** This effort minimizes or eliminates dramatic effects of dynamically changing terrain states on sensing and maneuvers operations conducted by the Army. This effort also provides effective decision-making tools such as models, simulations and mission planning and rehearsal factors to accurately predict the state of the ground, near-surface atmospheric conditions, and system performance in complex environments. ***FY 2011 Plans:*** Matrix test chemical, biological, radiological, nuclear and explosives reporters, which are engineered materials that emit signals when triggered by a target molecule. Conduct laboratory and field trials under real environmental conditions to optimize reporter selection for incorporation into a nano-material tool kit. ***FY 2012 Plans:*** Will develop data collection and processing algorithms for novel and advanced full waveform Geiger-mode light detection and ranging (LIDAR) data output for improved terrain analysis.	-	3.517	2.836
Title: Imagery and GeoData Sciences	-	2.514	3.230

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Description: This effort provides geospatial intelligence techniques that support the warfighter by providing a technical preparation of the joint operating environment (JOE); providing an information preparation of the JOE; and providing capability to evolve and transition an Army geospatial enterprise supporting mission and battle command functions and processes. ***FY 2011 Plans:*** Develop urban mapping tools and techniques, including modeling complex buildings, roofs, building interiors, and subterranean features. ***FY 2012 Plans:*** Will develop new feature extraction workflows that combine multi-source high-resolution imagery with elevation data to address tactical data gaps; provide capability to evolve and transition an Army geospatial enterprise supporting mission and battle command functions and processes.			
Title: Geospatial Reasoning ***Description:*** This effort designs and develops mature technologies that address joint operating environment awareness, maneuver support, and understanding of the battlespace environment; this effort also conducts operational research and development to create an integrated game-board of landscapes and relationships supporting Intelligence Preparation of the Battlefield (IPB) for Civil Military Operations (CMO). ***FY 2011 Plans:*** Develop geospatially-enabled decision support aids to meet uncertain adaptive threats and develop techniques to increase the rate at which large volumes of geospatial data and products are disseminated. ***FY 2012 Plans:*** Will develop rapid field-accessible terrain analysis tools for urban and complex environments; will develop urban and complex environment sensor placement decision support tools; will create an integrated game-board of landscapes and relationships supporting IPB for CMO.	-	1.511	3.540
Title: Geospatial Infostructure & Framework ***Description:*** This effort develops and evaluates technologies that address Future Force battlespace awareness capability shortfalls, and where feasible, enhance Current Force capabilities through spiral development technology insertions. ***FY 2011 Plans:***	-	5.766	5.655

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Incorporate weather effects and cultural feature analysis to support unmanned systems command and control; develop a framework for describing elements of political, military, economic, social, infrastructure, and information domains and linking to temporal and spatial analysis. ***FY 2012 Plans:*** Will develop feature linkage tools to identify common features across databases, opposing force movement index-based on suppression and interdiction capabilities, and data mining algorithms to support detection of important events.			
Title: Geo-Enabled Battle Command ***Description:*** This effort designs, develops, and provides agile and rapid military decision making process within a joint/coalition environment through semantic-based interoperability and use of mission-relevant geospatial information. ***FY 2011 Plans:*** Extend common geospatial architecture and services to support geospatial analysis tools and linkages to command and control for U.S. and coalition force applications. ***FY 2012 Plans:*** Will develop a geospatial architecture allowing input of user-generated content into the information system to enhance the decision-making battle command process.	-	3.748	2.095
Accomplishments/Planned Programs Subtotals	15.261	17.056	17.356

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
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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
H71: *Meteorological Research for Battle Command*	5.627	5.588	6.157	-	6.157	6.298	6.444	6.592	6.742	Continuing	Continuing

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

This program element (PE) investigates, evaluates, and matures military engineering technologies. The objective of this project is to perform applied research and development of tactical weather and atmospheric effects/impacts algorithms and for their integration into battlefield information products. The Army requires capabilities to enhance battlefield commanders and Soldiers decision making based on knowledge of tactical weather data and other environmental impacts. The weather intelligence data must not only be accurate and timely, but also be distributed down to the lowest levels of command, (e.g., individual Soldier). Technologies include high-resolution, local assessments and forecasts of meteorological conditions in near real time including effects of urban and mountainous terrain; analytical tools to assess the impact of the atmosphere to optimize system performance and operations planning; and advanced atmospheric sensing applications to characterize and mitigate wind and turbulence in complex terrain. It provides detailed model applications for various effects of the atmosphere on electro-optical and acoustic target detection, location, and identification. This project develops both physics-based decision aids and rule-based decision support systems for assessing the impacts of weather/atmosphere across a spectrum of friendly and threat weapons systems, sensors, platforms, and operations. The technology can be applied to mission planning and execution, battlefield visualization, reconnaissance surveillance and target acquisition, route planning to maximize stealth and efficiency, web enabled tactical decision aids, and also modeling of environmental impacts for combat simulations and war games. This project supports the future Army through research and development of novel environmental methods and applications that support echelons at Brigade and below (down to the individual Soldier). Products include atmospheric impacts on Army systems and personnel, an Army scale on-scene weather sensing and prediction capability, optical imaging and acoustic tools for automatic target recognition, optical imaging tools for improvised explosive device (IED)/anomaly detection, and physics-based acoustic tools for helicopter collision avoidance and improved source localization.

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 transitions technologies to the Project Manager for Target Identification and Meteorological Systems for field artillery systems, and to the Department of Defense weather and operations modeling community, and the Program Manager, Distributed Common Ground System-Army (DCGS-A), the Joint Improvised Explosive Device (IED) Defeat Organization, the Program Executive Office Aviation, the Product Manager, Tactical Airspace Integration System, and Project Manager for Robotics and Unmanned Sensors.

Work in this project is performed by the Army Research Laboratory located at Adelphi, MD/White Sands Missile Range, NM.

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Weather Modeling ***Description:*** This effort develops new high resolution, short-range forecasting and high resolution urban diagnostic modeling capabilities. ***FY 2010 Accomplishments:*** Completed a dynamic weather data assimilation package for Weather Running Estimate-Nowcast (WRE-N) model; coupled a diagnostic microscale model 3-dimensional wind field (3DWF) to provide high resolution meteorological sources for weather products and applications; and improved the physics and computational accuracy of the 3DWF diagnostic model and follow-on 2-dimensional prognostic Atmospheric Boundary Layer Environment (ABLE) model by applying an immersed boundary approach and parameterization of unresolved turbulence to better model the effects of complex steep topography such as mountains and high-rise buildings in urban terrain. ***FY 2011 Plans:*** Complete a full physics version of the Weather Running Estimate-Nowcast (WRE-N) model for Defense Common Ground Station - Army (DCGS-A) Nowcasting, and verify the accuracy improvements in the 3DWF and ABLE models achieved by applying an immersed boundary method and parameterizations of unresolved turbulence in high resolution urban and complex terrain. ***FY 2012 Plans:*** Will develop computational optimization methods for the Atmospheric Boundary Layer Environment (ABLE) model using advances in high performance computing to produce a very high resolution meteorological model for use in urban and complex terrain; and will improve the Weather Running Estimate-Nowcast (WRE-N) model at kilometer and sub-kilometer scales validated with the data resulted from the model accuracy assessment studies.	2.259	2.188	2.405
Title: Weather Diagnostics ***Description:*** This effort measures critical value thresholds for weather impacts on systems for tactical decision aids; and devises technologies to improve environmental awareness and to enhance and protect autonomous and semi-autonomous systems. ***FY 2010 Accomplishments:*** Integrated acoustic detection algorithms into the Aviation Weather Routing Tool and verified the light urban model effects integrated into Target Acquisition Weapons Software to extend the capability to environmental effects in applications; developed bio-inspired methods to use local environmental sensing information to improve the performance and survivability of autonomous and semi-autonomous systems in complex terrain and urban atmospheric environments; and verified atmospheric propagation effects on wideband acoustic signals and develop applications that use wideband acoustics to improve local environment sensing. ***FY 2011 Plans:***	1.697	1.721	1.899

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Implement methods for optimizing aircraft routing in adverse weather conditions and integrate Atmospheric Impacts Routing 4-dimensional visualization, situational awareness tools, and weather decision support systems to improve the safety and efficiency of unmanned and manned aviation; experimentally validate applications of wide band acoustic information processing to improve the characterization of local atmospheric parameters and to detect, locate and identify sources of emitted and reflected acoustic sources. ***FY 2012 Plans:*** Will develop weather effects application models for the improved design of emerging technologies such as Terahertz spectroscopy and imaging systems, continuous solid state high energy laser weapons, and passive short wave infrared imaging systems; and will develop analysis tools to fuse thermal and infrared polarimetric images, so as to achieve increased target detection.			
Title: Weather Prediction ***Description:*** This effort devises models to improve prediction of atmospheric conditions in urban and complex terrain that integrate high resolution boundary layer meteorological (MET) measurements and verifies high resolution boundary layer models with field measurements. ***FY 2010 Accomplishments:*** Completed and evaluated the Doppler light detection and ranging (LIDAR) analysis toolkit for improving the effectiveness of real-time LIDAR data; investigated receiver arrays for remote sensing LIDAR. Investigated two-wavelength laser induced fluorescence spectra of aerosols; analyzed chemical and biological assays of aerosols to improve environmental monitoring; performed sampling with novel aerosol sampling equipment and analyzed coupled meteorological-sampler data in support of Warfighter health and enhance force protection; developed and evaluated a Local-Rapid Evaluation of Atmospheric Conditions (L-REAC) system to provide continuous automated 24/7 detailed wind flow maps to garrison commanders over installation and down to individual building scales by integrating local meteorological and terrain data, forecasts and urban wind models to support installation and forward operating base force protection. ***FY 2011 Plans:*** Complete testing of coupled 3DWF and WRE-N models for transition to the Distributed Common Ground System - Army (DCGS-A) Weather Services; employ active LIDAR with passive spectral sensing systems for environmental characterization; and extend the L-REAC system to integrate additional hazard models that will improve decisions on evacuation versus shelter in place and safe routing of emergency responders. ***FY 2012 Plans:***	1.671	1.679	1.853

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Will integrate real time networked environmental sensors and produce optimized sensor placement recommendations from the L-REAC system; and will complete accuracy studies of coupled microscale wind model with WRE-N for transition to DCGS-A.			
Accomplishments/Planned Programs Subtotals	5.627	5.588	6.157

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 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602784A: *MILITARY ENGINEERING TECHNOLOGY*	PROJECT T40: *MOB/WPNS EFF TECH*	

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
T40: *MOB/WPNS EFF TECH*	20.303	31.231	41.052	-	41.052	38.092	34.630	29.722	30.237	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

This program element (PE) investigates, evaluates, and develops technologies for adaptive and expedient force protection across the range of military operations; for overcoming battlespace gaps (such as cliffs, ravines and other natural obstacles) through prediction, definition, avoidance, or defeat of the gaps; investigates technologies for rapid port enhancement; for scalable weapons effects; and for high-resolution representation of near-surface terrain and environment for use with sensor models for things such as target recognition and unmanned ground systems (UGS). This research supports development of the future force by providing physics-based representations of mobility, obstacle and barrier placement, survivability, and weapons effects in urban terrain modeling and simulation. Additionally, the project develops and assesses technologies that increase the survivability of critical assets from conventional and terrorist weapons, and maneuver support of deployed forces, while reducing their logistical footprint. Work in this project starting in FY12 in deployable force protection (DFP) supports overcoming critical capability gaps for protecting troops operating at smaller bases that are remote or integrated in with local communities.

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 US Army Engineer Research and Development Center, Vicksburg, MS.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Adaptive Protection	8.297	10.645	6.483
Description: This effort develops, evaluates, and validates technologies that address Future Force protection capability shortfalls; and where feasible, enhance Current Force capabilities through spiral development technology insertions.			
FY 2010 Accomplishments: Developed interim lightweight rapidly erected protective systems for use inside and outside base perimeters to defeat emerging weapons effects; developed the capability to accurately predict vehicle loadings due to subsurface explosive detonations; and provided these models to armor/platform designers to increase the survivability of the current and future tactical wheeled vehicle fleet.			
FY 2011 Plans:			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Design and develop a computational protection testbed for validated high-performance modeling to predict and evaluate protective material and system response to blast and ballistic loads. Develop and evaluate force protection technologies for use in remote outposts or in other expeditionary modes, where there is little access to engineering equipment and explore options for use of organic materials in conjunction with light-weight, blast and penetration resistant composite materials and detection capabilities. This work is performed in collaboration with PE 0603005A/221 and activities in PE 0602618A and PE 0602105A. ***FY 2012 Plans:*** Will investigate and validate novel layered protective systems to include overhead protection from direct and indirect fire that must defeat large-caliber rockets, vehicle borne-improvised explosive devices (IEDs), human borne-IEDs, and shoulder-fired rockets; will mature the numerical modeling capability of ground vehicle protective schemes against surface and buried threats by improving coupling between the blast events, vehicles, and occupants. This work will be performed in collaboration with PE 0603005A/221 and activities in PE 0602618A and PE 0602105A.			
Title: Austere Entry and Maneuver ***Description:*** The objective of this research project is to develop and demonstrate technologies that address Future Force enable theater access strategic responsiveness capability shortfalls, and where feasible, enhance Current Force capabilities through spiral development technology insertions. ***FY 2011 Plans:*** Provide modeling solutions of physical and operational conditions (i.e. wetland, mudflats, or shallow rivers) that provide improved logistics and force projection capability for austere entry and maneuver. ***FY 2012 Plans:*** Will design and begin development of a sea-land intermodal mobility bridge for ship to shore transit of heavy military equipment and ground vehicles as well as heavy-lift expedient landing platforms and surfaces for aircraft.	-	1.036	2.000
Title: Scalable Weapons Effects ***Description:*** This effort provides a prediction capability for effects from scalable, selectable, and adaptive weapons that can destroy target function and/or neutralize attributes while limiting damage to surrounding structures/personnel. ***FY 2010 Accomplishments:*** Investigated warhead technologies for rapid wall breaching that can create a man-sized hole in a double-reinforced concrete wall in a single step, reducing time on target and enhancing Soldier survivability; quantified damage to concrete, brick, and adobe walls due to prototype shoulder launched munitions impact; completed evaluations of multi-phase low-to-high order detonation-	5.105	4.203	5.806

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
blast effects against urban walls; conducted perforation evaluations against ultra-high strength concrete panels with current and advanced weapon designs; and characterized advanced materials. ***FY 2011 Plans:*** Participate in demonstrations of small, medium and large caliber scalable weapons against urban structure and bunker targets. Will provide ballistic data to validate and finalize prediction capabilities developed in for the use of scalable weapons. This work is performed in collaboration with PE 0602618A/H80, PE 0602105A/H84, PE 0602624A/H18/AH28, PE0603004A/232, PE 06022303A/214. ***FY 2012 Plans:*** Will complete development and will investigate the performance of the shoulder launched wall breaching system against reinforced concrete, triple block, and concrete masonry units; will complete weapon back-blast simulation methods to address safety concerns about firing in confined urban spaces. This work will be performed in collaboration with PE 0602618A/H80, PE 0602105A/H84, PE 0602624A/H18/AH28, PE0603004A/232, PE 06022303A/214.			
Title: Geospatial Research and Engineering Support ***Description:*** This effort develops analytic and decision support tools that provide actionable information of terrain, atmospheric and weather impacts on units, systems, platforms and soldiers to support Battle Command and Intelligence, Surveillance and Reconnaissance decision making. ***FY 2010 Accomplishments:*** Completed development of roadway and gap attribute intensification algorithms to improve mission planning and assessment of austere areas of operations.	0.460	-	-
Title: Near Surface Effects ***Description:*** This effort develops a physics-based, multiscale numerical testbed for virtual testing of unmanned ground systems for intelligent autonomous navigation and tactical behaviors for sensors and develops high fidelity models for surface and subsurface environment impacts and interactions with sensors. ***FY 2010 Accomplishments:*** Provided sophisticated innovative physics models for disturbed soil phenomenology to identify improvised explosive device (IED) locations. Developed joint architecture for unmanned systems compliant components for performance evaluations (i.e. tactical behaviors and perception submodels) for unmanned systems during mission simulations in complex environmentally enriched models. ***FY 2011 Plans:***	6.441	7.683	9.712

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APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602784A: *MILITARY ENGINEERING TECHNOLOGY*	PROJECT T40: *MOB/WPNS EFF TECH*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Provide novel automated target recognition algorithms for electro-optical, infrared, radar and multi-modal sensors. Develop and validate parameter estimation models to approximate terrain surface properties for false alarm reduction. Integrate sensor perception in unmanned systems for improved autonomous performance. ***FY 2012 Plans:*** Will provide high fidelity models to predict and improve the performance of current and future force sensor systems operating in multiple sensor modalities within complex geoenvironmental settings; will complete new perception algorithms of terrain to enable adaptive tactical behavior technologies for unmanned ground vehicles; will investigate technologies and methods leading to use of sensors above the soil surface with equivalent sensitivity as buried sensors thus allowing for adaptive use in variable environments; will research methodologies for characterizing sensor performance in areas where there is limited ground truth data.			
Title: NORAD-NORTHCOM Surveillance Research ***Description:*** This effort develops a physics-based, multi-scaled numerical testbed that provides an enriched virtual environment for evaluating, fusing, and simulating the interaction of local sensors with environmental factors; this effort would also develop high fidelity models to predict and improve performance of current and future force sensor systems for surface, near-surface, and sub-surface target detection within complex geo-environmental settings (solar, weather, soil, vegetation, clutter, etc.). ***FY 2011 Plans:*** Mature capability to image subsurface voids, or tunnels, up to thirty feet below surface. Conduct experiments using technologies and sensor fusion capabilities to characterize tunnel features, (such as axes of approach and cross sections) and movement of contraband. ***FY 2012 Plans:*** Will continue additional experiments of integrated technologies and sensor fusion capabilities to characterize tunnel features; will develop a physics-based, multi-scaled numerical testbed that provides an enriched virtual environment for evaluating, fusing, and simulating the interaction of local sensors with environmental factors to provide the ability to detect, deny, and aggressively alert Warfighters to clandestine subsurface approaches.	-	3.659	2.050
Title: Joint Integrated Base Defense ***Description:*** This funding is intended to support the stand-up of a Joint Program Office. ***FY 2011 Plans:***	-	4.005	4.000

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602784A: *MILITARY ENGINEERING TECHNOLOGY*	PROJECT T40: *MOB/WPNS EFF TECH*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
This funding is intended to support the stand-up of a Joint Program Office (JPO) with the purpose of achieving integration and interoperability among different sensor systems and suites used in bases and base camps, to include expeditionary and smaller base camps. It is understood that funding for this program will be moved to an appropriate non-S&T PE and project by FY12. ***FY 2012 Plans:*** This funding is intended to support the stand-up of a JPO. The funding is expected to be reprogrammed to a non-S&T PE by FY12 to support the efforts of the JPO.			
Title: Deployable Force Protection ***Description:*** This effort researches, designs, and develops rapidly deployable detection, assessment, and defensive technology-enabled capabilities to meet critical capability gaps for troops operating remotely at smaller bases or integrated with local communities. ***FY 2012 Plans:*** Will perform research to address high priority capability gaps in force protection needs for smaller bases operating in remote areas or integrated with local communities; will continue research on previously selected technologies to improve designs based on user assessment and feedback; will design and begin development of an integrated simulation tool for technology exploration and to provide decision support for identifying system improvements. This work is done in collaboration with PE 0603784A, PE 0603125A, PE 0603313A and PE 0602786A. This work is performed in PE 0602784/T41 in FY 11.	-	-	10.000
Title: Materials Modeling ***Description:*** This effort investigates and leverages physics-based computational models and laboratory experiments to understand the relationships between the chemical and micro-structural composition of material and its performance characteristics when used in protecting facilities. ***FY 2012 Plans:*** Will continue to develop foundational knowledge of nano- and macro-scale physical, chemical, and mechanical properties of materials for improved performance through computational modeling and laboratory experimental research with focus on composite and bio-inspired materials with exceptional properties such as tensile strength and resistance to cracking and penetration. This work is a continuation of work performed in 0602784/T41 in FY 11, Materials Modeling and is coordinated with ongoing activities in PE 0602720A/835, Nanotechnology - Environmental Effects.	-	-	1.001
Accomplishments/Planned Programs Subtotals	20.303	31.231	41.052

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602784A: *MILITARY ENGINEERING TECHNOLOGY*	PROJECT T40: *MOB/WPNS EFF TECH*

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 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602784A: *MILITARY ENGINEERING TECHNOLOGY*	PROJECT T41: *MIL FACILITIES ENG TEC*	

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
T41: *MIL FACILITIES ENG TEC*	4.369	16.949	7.305	-	7.305	7.576	7.736	6.962	5.146	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

This program element (PE) investigates and evaluates technologies and techniques to ensure sustainable, cost efficient and effective facilities and to achieve resilient and sustainable installation and base operations. The project focuses on facilities and operations technologies directly supporting training, readiness, force projection, force protection, homeland security, and forward base operations. Facility enhancement technologies contribute to cost reductions in the Army facility life cycle process (infrastructure planning, assessment, design, construction, revitalization, sustainment, and disposal), and the supporting installation operations. This work improves the ability of installations to support forces to meet transformation goals, improves designs for close battle training facilities, and enhances security of Soldiers, families, and civilians. Technologies evolving from this work include integrated planning and design tools for US facilities and forward bases, models predicting water dispersed contaminant effects on facilities and occupants; sustainable facility and base management; collaborative decision support tools; and advanced materials. In addition, technologies from this work will support analysis of socio-cultural and facility issues in forward base operations, including urban environments.

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 US Army Engineer Research and Development Center, Vicksburg, MS. The work in deployable force protection is coordinated with the 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: Multi-functional materials in support of Defeat of Emerging Adaptive Threats (DEFEAT)	2.796	2.860	0.900
Description: This effort assesses and develops self healing technologies; evaluates protective systems; and assesses the use of novel materials in multi-functional structural protection.			
FY 2010 Accomplishments: Conducted assessment of material enhancement using self healing technologies; began development of micro-scale design of high-performance carbon nanotube-composite materials.			
FY 2011 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602784A: *MILITARY ENGINEERING TECHNOLOGY*	PROJECT T41: *MIL FACILITIES ENG TEC*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Conduct evaluations of multi-layered protective systems and perform protection laboratory assessment; and develop decision tools for user community. ***FY 2012 Plans:*** Will complete laboratory assessment of material self healing technologies and optimal design methods for composite plates; will integrate use of novel materials into multi-functional structural protection systems. Transition of these products will be to PE 0603734A project T08 supporting Army Technology Objective DEFEAT.			
Title: Facility Modeling and Simulation ***Description:*** This effort develops sustainable, cost efficient and effective facilities; and provides technologies and techniques for achieving resilient and sustainable installation and base operations. ***FY 2010 Accomplishments:*** Developed and demonstrated new approach to advanced material development: closely-coupled atomistic simulations and nanoscale experiments. Developed a model for integrated ontology, or standardized categorization, for facility life-cycle model. Incorporated near real-time assessment of facility sustainment metrics for energy and water and expanded model framework for net-centric regional management with emerging resiliency concepts. Initiated micro-scale design of high-performance CNT-composite materials. ***FY 2011 Plans:*** Develop sensor integration sub-models to incorporate into a facility life-cycle model designed to reduce uncertainty in infrastructure costs and maintenance; develop sensor fusion algorithms for facility life-cycle model; conduct evaluations of multi-layered protective systems and protection decision/assessment tools. ***FY 2012 Plans:*** Will design and develop a computational framework for expanding to net-centric regional management of facilities with emerging resiliency concepts; will begin design of computer models to facilitate assessment of forward operating base operations to increase effectiveness and efficiency. This effort will be coordinated with efforts in PE 0602720A/T48 and PE 0602786A/VT4 and VT5.	1.573	1.333	3.405
Title: Socio-Cultural Modeling ***Description:*** This effort provides technologies which support analysis of socio-cultural and facility issues in forward base operations, including urban environments. Technology development efforts will include means to identify dynamic signatures, or indicators, in the socio-cultural realm to assist in estimating or predicting behavioral response to operations. ***FY 2011 Plans:***	-	2.750	3.000

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Develop models relating socio-cultural and cultural geographic factors to human behaviors to inform decision making in Counter-Insurgency Operations, Stability and Support Operations, and nation building; develop means to identify dynamic signatures, or indicators, in the socio-cultural realm to assist in estimating or predicting behavioral response to operations. ***FY 2012 Plans:*** Will extend the development of dynamic socio-cultural models for estimating host population response to military operations; will develop information framework linking socio-cultural data to Army tasks.			
Title: Materials Modeling ***Description:*** This effort improves designs for close battle training facilities; enhances security of Soldiers, families, and civilians; evolves technologies including integrated planning and design tools for US facilities and forward bases, and advanced materials to increase performance and decrease volume and weight while keeping the environment safe. ***FY 2011 Plans:*** Investigate and develop foundational knowledge of nano- and macro-scale physical, chemical, and mechanical properties of materials as well as understanding of the fate (i.e. movement, binding and degradation) of the materials once in the environment to research and develop designs that scale well for production and manufacturing; this research also focuses on composite materials with exceptional properties such as tensile strength and resistance to cracking and penetration; the goal is to increase performance and decrease volume and weight while keeping the environment safe. This work moves to PE 0602784A/T40 in FY12. This work is coordinated with Nanotechnology/Fate and Effects effort in PE 0602720A/Project 835.	-	1.006	-
Title: Deployable Force Protection ***Description:*** Develop rapid stand-off threat detection, warning capability, and survivability implementation using lightweight, low power technology that promotes survivability of fixed-sites and dismounted personnel in irregular warfare scenarios. ***FY 2011 Plans:*** Develop integrated system constructs for base protection technologies at smaller bases that often operate in remote locations or are near/with local populations and have a less overt security posture. The integrated designs include interoperable systems that are reliable, transportable by smaller vehicles or sling-load, use minimal power and energy, and have low manpower requirements for set-up and operation. Technologies pursued address detection of threats, assessment of activities and signals, and passive and active defense capabilities. Investigate means to increase sensor detection capabilities for layered defense of the operational environment, including electro-optical, infrared, seismic and acoustic. Develop designs for sustainable power and energy. This	-	9.000	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
effort moves to PE 0602784A/T40 in FY12. These efforts support deployable force protection activities in PE 0603734A, PE 0603313A, PE 062786A, and PE 0603125A.			
Accomplishments/Planned Programs Subtotals	4.369	16.949	7.305

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 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602784A: *MILITARY ENGINEERING TECHNOLOGY*	PROJECT T42: *Terrestrial Science Applied Research*	

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
T42: *Terrestrial Science Applied Research*	5.491	5.090	5.244	-	5.244	5.348	5.457	5.565	5.660	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

This program element (PE) investigates and evaluates the physical environment's effect on personnel, platforms, sensors, and systems in order to develop improved tactics, techniques, procedures, and plans that ensure information superiority, situational awareness, and force projection. Specifically, this project seeks solutions for minimizing or eliminating the adverse effects of dynamically changing terrain states on sensing capabilities, engineer construction, and tactical maneuver conducted by the Army. To achieve this, effective decision-making tools such as models, simulations, and mission planning and rehearsal factors are required that accurately predict the state of the ground, near-surface atmospheric conditions, and system performance in complex environments.

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 US Army Engineer Research and Development Center, Vicksburg, MS.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Terrain State	1.770	1.426	2.015
Description: This effort provides Warfighters with an accurate and timely understanding of the battlespace environment's effect on personnel, platforms, sensors, and systems in order to develop improved tactics, techniques, procedures, and plans that ensure information superiority, situational awareness, and force projection. Specifically, this project seeks solutions for minimizing or eliminating the adverse effects of dynamically changing terrain states on sensing capabilities, engineer construction, and tactical maneuver conducted by the Army.			
FY 2010 Accomplishments: Developed algorithms to interpret local terrain characteristics from on-board vehicle sensors (tactile and stand-off) through real-time terrain characterization for on-board mission decision logic to assure the tactical mobility of manned and unmanned ground systems on complex terrain.			
FY 2011 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602784A: *MILITARY ENGINEERING TECHNOLOGY*	PROJECT T42: *Terrestrial Science Applied Research*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Design weather effects physical security sensor planning tool integrated with passive protection systems. ***FY 2012 Plans:*** Will incorporate an optimal sensor placement and selection model including stationary and moving surveillance platforms into the Environmental Awareness for Sensor and Emitter Employment model supporting integration of many different sensors in the battlespace; develop a framework to achieve effective persistent monitoring of targets of interest, ground and airborne, providing timely knowledge of multi-modality sensor performance in dynamic complex weather-affected terrain and adverse weather conditions.			
Title: Signature Physics ***Description:*** This effort investigates the battlespace environment effect on personnel, platforms, sensors, and systems in order to develop improved tactics, techniques, procedures, and plans that ensure information superiority, situational awareness, and force projection. Specifically, this project seeks solutions for minimizing or eliminating the adverse effects of dynamically changing terrain states on sensing capabilities, engineer construction, and tactical maneuver conducted by the Army. ***FY 2010 Accomplishments:*** Built geo-precise software tools incorporating awareness about the physical environment (known and unknown) to optimize sensor emplacement and selection of sensor asset mixes. ***FY 2011 Plans:*** Define normal and anomalous sensor data features (statistical properties) as a function of the geospatial and socio-cultural context; leverage the Warfighter's understanding of important features and contextual cues; and develop street-level simulation of sensor data across a wide range of modalities and urban terrain contexts to develop signal propagation rules for fusion and anomaly recognition. Develop re-usable, object-oriented, software tools for cross-modality sensor performance modeling, high-level fusion including operational environment context, and emplacement recommendations that can be readily incorporated into Army command and control and terrain analysis systems. ***FY 2012 Plans:*** Will design and develop random sampling approaches for uncertainties across multiple sensing modalities and establish quantifiable approaches for the value of increased terrain and weather resolution on signal propagation predictive skill; will develop an adequate definition of the soil biology as a function of prevailing conditions, such as soil-water potential and temperature that can be predicted or measured using stand-off techniques supporting emerging developments of bio-inspired persistent standoff sensing capabilities.	3.721	3.664	3.229
Accomplishments/Planned Programs Subtotals	5.491	5.090	5.244

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
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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 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602784A: *MILITARY ENGINEERING TECHNOLOGY*	PROJECT T45: *ENERGY TEC APL MIL FAC*	

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
T45: *ENERGY TEC APL MIL FAC*	3.237	3.275	3.203	-	3.203	3.206	3.270	3.335	3.392	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

This program element (PE) investigates and evaluates technologies necessary for secure, energy efficient, sustainable military installations, emphasizing energy and utility systems protection in response to evolving needs. Energy technologies and processes are also applied to the Army's industrial base to maintain its cost-effective readiness for munitions production, training, and in the theater of operations to reduce logistical footprint. This effort provides technologies to protect facility indoor air quality from contaminants such as mold, bacteria and viruses in work and living spaces as well as develops methods to optimize sustainable energy generation and use including integration of renewable energy resources and approaches for the reduction of carbon footprint. In addition, technologies from this work provide a better understanding of critical infrastructure interdependencies.

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 US Army Engineer Research and Development Center, Vicksburg, MS.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Systems Response to Threats	2.437	1.701	-
Description: This effort investigates and validates technologies necessary for secure, energy efficient, sustainable military installations, emphasizing energy and utility systems protection from, and in response to, evolving threats such as chemical, biological and radiological attacks. ***FY 2010 Accomplishments:*** Predicted nanosensing complex stability under long term storage conditions that involved evaluating the stability of fluorescent nanoparticles, conjugated with antibodies, at various temperatures and in different environments. ***FY 2011 Plans:*** Evaluate sensing ability with encapsulation and re-suspension after freeze drying to assess improving the stability of the complex using chemical preservatives and encapsulation with silica.			
Title: Installation Modeling and Simulation	0.800	1.574	3.203

Exhibit R-2A, RDT&E Project Justification: PB 2012 Army		DATE: February 2011
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Description: This effort investigates and develops technologies necessary for energy efficient and sustainable military installations, emphasizing energy and utility systems. ***FY 2010 Accomplishments:*** Initiated development of parametric models of most effective energy measures for high demand Army facilities and initiated algorithms to identify high value clusters of facilities with complementary spatial, thermal, hydraulic, and electric power characteristics to provide enterprise solutions for Army Installations future energy efficiency requirements. ***FY 2011 Plans:*** Develop a computational framework for non-linear network simulation to predict performance and optimize integration of installation energy systems. ***FY 2012 Plans:*** Will mature operational user assessment of installations energy systems with a decision support concept; will begin design on a model for assessment and mitigation of energy losses.			
Accomplishments/Planned Programs Subtotals	3.237	3.275	3.203

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 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602784A: *MILITARY ENGINEERING TECHNOLOGY*	PROJECT T48: *Center for Geosciences & Atmospheric Research*	

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
T48: *Center for Geosciences & Atmospheric Research*	2.985	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Geosciences/Atmospheric Research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Geosciences/Atmospheric Research	2.985	-	-
Description: This is a Congressional Interest Item.			
FY 2010 Accomplishments: This funding supports the Center for Geosciences & Atmospheric Research			
Accomplishments/Planned Programs Subtotals	2.985	-	-

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 2: *Applied Research*	R-1 ITEM NOMENCLATURE PE 0602784A: *MILITARY ENGINEERING TECHNOLOGY*	PROJECT T53: *Military Engineering Applied Research (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
T53: *Military Engineering Applied Research (CA)*	3.263	-	-	-	-	-	-	-	-	Continuing	Continuing

Note

Not applicable for this item

A. Mission Description and Budget Item Justification

Congressional Interest Item funding for Military Engineering applied research.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Cellulose Nanocomposite Panels for Blast and Ballistic Protection ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** This effort addressed the development, manufacture, design, and utilization of nano-filled composites using thermosetting, thermoplastic, and inorganic matrices.	1.591	-	-
Title: Environmentally Intelligent Moisture and Corrosion Control for Concrete ***Description:*** This is a Congressional Interest Item. ***FY 2010 Accomplishments:*** Demonstrated hydrophobic concrete in a potable water treatment facility renovation at Ft. Detrick, MD.	1.672	-	-
Accomplishments/Planned Programs Subtotals	3.263	-	-

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.