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Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army **DATE:** February 2011

APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604716A: <i>TERRAIN INFORMATION - ENG DEV</i>
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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
Total Program Element	-	-	1.596	-	1.596	0.997	-	-	-	Continuing	Continuing
579: <i>FIELD ARMY MAP SYS ED</i>	-	-	1.596	-	1.596	0.997	-	-	-	Continuing	Continuing

Note

FY01 - Additional funding supports initiation of Research and Development of an automated tactical engineer command and control, mission planning and decision support capability.

A. Mission Description and Budget Item Justification

The Project Director for Combat Terrain Information Systems (PD CTIS) is responsible for developing topographic support systems for the Army. CTIS systems provide automated terrain analysis, terrain data management and graphics reproduction in support of Intelligence Preparation of the Battlefield (IPB), Command and Control, Terrain Visualization, weapons and sensor systems, and other topographic information customers. CTIS consists of the Digital Topographic Support System - Light (DTSS-L), DTSS-Heavy (DTSS-H), DTSS-Deployable (DTSS-D), DTSS-Base (DTSS-B) and the High Volume Map Production (HVMP) equipment. A Pre-Planned Product Improvement (P3I) program will be conducted to address technology insertion, technology refreshment of Commercial Off-the-Shelf equipment and modernization initiatives for the Topographic Support System (TSS). Experimentation results from the Div XXI Army Warfighter Experiment (AWE) identified technological enhancements necessary to support the First and Second Digital Divisions (FDD) and the Transformation Brigades. CTIS systems support the Legacy to Objective transition path of the Transformation Campaign Plan (CTP).

B. Program Change Summary (\$ in Millions)

	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012 Base</u>	<u>FY 2012 OCO</u>	<u>FY 2012 Total</u>
Previous President's Budget	-	-	-	-	-
Current President's Budget	-	-	1.596	-	1.596
Total Adjustments	-	-	1.596	-	1.596
• Congressional General Reductions					
• Congressional Directed Reductions					
• Congressional Rescissions	-	-			
• Congressional Adds					
• Congressional Directed Transfers					
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments 1	-	-	1.596	-	1.596

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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
579: <i>FIELD ARMY MAP SYS ED</i>	-	-	1.596	-	1.596	0.997	-	-	-	Continuing	Continuing
Quantity of RDT&E Articles											

Note

Not Applicable for this item.

A. Mission Description and Budget Item Justification

This Project funds development of the Digital Topographic Support System (DTSS). All DTSS systems use Commercial Off the Shelf (COTS) software. DTSS variants include the: DTSS-Light (DTSS-L) which is shelter mounted on a HMMWV, DTSS-Deployable (DTSS-D) which is mounted in hand carried transit cases), DTSS-Base (DTSS-B) which is garrison based for data generation, and the High Volume Map Production System (HVMP) which reproduces digital maps. Current force DTSS systems provide the commander the ability to rapidly obtain terrain information and produce digital topographic products. The traditional terrain analysis, topographic and reproduction support provided by Army Engineer Terrain Teams was a slow, labor intensive process that does not meet the needs of the digital battlefield. The DTSS provides digital terrain analysis and map updates to commanders and weapons platforms in support of mission planning (e.g., imagery exploitation, Cover and Concealment, other Intelligence Preparation of the Battlespace), rehearsal (e.g., 3D fly through, simulations) and execution (e.g., Common Operational Picture, route planning). The DTSS automates terrain analysis and visualization, data base (development, updating, management, and dissemination), and graphics reproduction. The Combat Terrain Information Systems (CTIS) Modernization Plan emphasizes the development of a combined, integrated, tactically deployable, fully autonomous terrain analysis and graphics reproduction capability. These capabilities are being provided in HMMWV shelterized (DTSS-L) and transit case (DTSS-D) configurations. The DTSS-L is highly mobile and capable of supporting a full range of military operations, as well as peacetime stability and support operations. The DTSS-L has been Type Classified-Standard. The DTSS-D provides a COTS configuration that is capable of operating all of the terrain analysis software. The DTSS-D consists of transportable workstations and peripherals that can be set up to augment the tactical configurations. The DTSS-D does not include tactically deployable shelters and vehicles or tactical communications. The DTSS-D has been Type Classified-Standard. The DTSS-B was procured in response to a US Army Europe (USAEUR) initiative to develop the capability to generate terrain information over sparsely mapped areas to support contingency, mission rehearsal, and training operations. The DTSS-B is designed to augment the National Geospatial-Intelligence Agency (NGA) capabilities at the Echelon above Corps (EAC) level by providing quick response data generation, special purpose mapping, terrain analysis, and theater geospatial data baseing. The DTSS-B includes a component that is capable of handling National Technical Means information in a secure environment. The DTSS-B has been Type Classified-Standard. The HVMP provides a tactical capability to rapidly reproduce large volumes of topographic materiel from digital sources. HVMPs are capable of reproducing information from a variety of digital and hardcopy sources via direct digital interfaces. CTIS systems are deployed from Brigade through Echelon above Corps, Stryker Brigades and Special Forces Groups. Additionally, an institutional training classroom environment has been developed and integrated into the curriculum at the National Geospatial/Intelligence School (NGS). NGS provides critical MOS (Military Occupation Speciality) specific training on the operation and use of CTIS developed systems. Products developed as part of the CTIS RDT&E program (e.g., improved Battle Command Systems interoperability, migration to Joint Technical Architecture - Army (JTA-A) and Common Operating Environment (COE), improved data base management and distribution, automated feature extraction, improved tactical terrain decision aid functionality, rapid terrain visualization, battlefield terrain reasoning awareness (BTRA), migration to Distributed Common Ground Station - Army (DCGS-A) architecture, and improved graphics reproduction) are being incorporated into all of the DTSS hardware and software architectures. Additionally, the Current Force Topographic Support System (TSS)

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found in Engineer Topographic Companies is outdated and must be modernized to keep pace with Army digitization. The modernization associated with the TSS include replacing the Operations, Distribution and Photomechanical Sections with DTSS-L, DTSS-D, and the HVMP. The Survey section will be downsized to a HMMWV configuration and the Drafting section will be updated to include digital cartographic equipment. This system supports the Current-to-Future Force transition path.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2010	FY 2011	FY 2012
Title: Continue P3I development for DTSS.	-	-	1.596
Description: Continue P3I development for DTSS - Initiate transition of functionality to DCGS-A, continue investigation of COTS upgrades, continue improvement of coalition/joint interoperability.			
FY 2012 Plans: Continue P3I development for DTSS - Initiate transition of functionality to DCGS-A, continue investigation of COTS upgrades, continue improvement of coalition/joint interoperability.			
Accomplishments/Planned Programs Subtotals	-	-	1.596

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u> <u>Base</u>	<u>FY 2012</u> <u>OCO</u>	<u>FY 2012</u> <u>Total</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u> <u>Continuing</u>
• KA2550: <i>Digital Topographic Support System (DTSS)</i>	9.766	9.364								Continuing	Continuing

D. Acquisition Strategy

The Acquisition Strategy for the Digital Topographic Support System-Light (DTSS-L) Engineering Manufacturing and Development (EMD) phase was to utilize Army standard equipment and the Common Hardware/Software (CHS) computer workstations in conjunction with non-development item (NDI) components to develop an integrated baseline hardware configuration. The previous Combat Terrain Information Systems (CTIS) System Engineering and Integration (SE&I) contractor (Lockheed Martin Corp) executed the EMD phase, performing system integration, and provided units for formal test and evaluation. Milestone III for the DTSS-L was successfully completed in Jan 98. Production of the DTSS-L commenced in February 1999. Funding to support technology refreshment of the DTSS-Heavy (DTSS-H), DTSS-L, and DTSS-Deployable (DTSS-D) was programmed on a 5-yr. cycle. DTSS-L replaced the DTSS-H in FY02/03. Acquisition of the DTSS-D and DTSS-B was completed in FY 1995 and FY 1996, respectively. Based upon Combatant Commanders, TRADOC (Training and Doctrine Command) and PEO C3S (Program Executive Officer Command, Control, Communications, and Computers) User Evaluation approvals, the DTSS-D was Type Classified -Standard and added to the gaining unit's Table of Organization and Equipment. Funding to support a 5-year technology refreshment program for the DTSS-D commenced in FY 2000 and for the DTSS-B commenced in FY 2002. The DTSS-B has also been Type Classified-Standard. The acquisition of the DTSS-D and DTSS-B relied upon existing contracts and commercial-off-the-shelf to the fullest extent possible. The Project Office will continue with this strategy for all technology refreshment programs. The HVMP Acquisition Strategy utilizes COTS and NDI components integrated with Army standard hardware (e.g., trucks, shelters, power equipment) to develop an integrated baseline. The pre-planned product improvement program (P3I) is being executed by the current SE&I contractor (Northrup Grumman, Inc.). The contracting strategy for the DTSS-L

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program was to execute the EMD phase through the previous SE&I contractor, Lockheed Martin Corporation. A Competitive Cost Plus Fixed Fee (CPFF) contract was awarded for both the previous and existing CTIS SE&I contracts. A competitively awarded, Firm Fixed Price (FFP) contract was awarded to Sechan Electronics, Inc. for the Full Rate Production of the DTSS-Light. The HVMP contracting strategy is to execute the System Design and Demonstration (SDD) phase through the current SE&I contractor. A competitively awarded FFP contract was awarded to Sechan Electronics for the Full Rate Production of the HVMP. The computer workstations for CTIS programs were being procured, where appropriate, through the project manager for CHS.

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.