Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Army										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 2040: *Research, Development, Test & Evaluation, Army* BA 6: *RDT&E Management Support*				R-1 ITEM NOMENCLATURE PE 0605706A: *MATERIEL SYSTEMS ANALYSIS*							
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	20.970	18.078	19.669	-	19.669	20.294	20.386	19.919	20.140	Continuing	Continuing
541: *MATERIEL SYS ANALYSIS*	20.970	18.078	19.669	-	19.669	20.294	20.386	19.919	20.140	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element funds Department of the Army (DA) civilians at the Army Materiel Systems Analysis Activity (AMSAA) to conduct responsive and effective materiel systems analysis in support of senior Army decision making for equipping the U.S. Army. AMSAA conducts systems and engineering analyses to support Army decisions in technology; materiel acquisitions; and the design, development, fielding, and sustaining of Army weapon systems. As part of this mission, AMSAA develops and certifies systems performance data used in Army studies, and develops systems performance methodology and Modeling and Simulation (M&S).

AMSAA is the Army's center for item/system level performance analysis and certified data. In support of its materiel systems analysis mission, AMSAA analyzes the performance and combat effectiveness of conceptual, developmental, and fielded systems. Unique models and methodologies have been developed to predict critical performance variables, such as weapon accuracy, target acquisition, rate of fire, probability of inflicting catastrophic damage, and system reliability. AMSAA generates performance and effectiveness measures and ensures their standard use across major Army and Joint studies. AMSAA conducts and supports various systems analyses, such as: Analyses of Alternatives, system cost/performance tradeoffs, early science and technology tradeoffs, weapons mix analyses, system risk assessments, analytical support for Test and Evaluation, and requirements analyses. These analyses are used by the Army Research, Development and Engineering Command, Army Materiel Command, Training and Doctrine Command, Army Test and Evaluation Command, Program Executive Officers/Project Managers, DA staff/ Assistant Secretary of the Army for Acquisition, Logistics, and Technology, and Department of Defense (DoD) leadership in making acquisition, procurement, and logistics decisions in order to provide quality equipment and procedures to the Soldier.

AMSAA's M&S capabilities support the development, linkage, and accreditation of live, virtual, and constructive simulations, and provide unique tools that support systems analysis of individual systems and the combined-arms environment. AMSAA maintains a significant number of models and simulations, most of which were developed in-house to address specific analytical voids. This M&S infrastructure provides a hierarchical modeling process that is unique to AMSAA and allows for a comprehensive performance and effectiveness prediction capability that can be utilized to make trade-off and investment decisions prior to extensive and expensive hardware testing of proposed systems/technologies for Current and Future Force efforts. AMSAA is the Army's executive agent for the verification, validation, and accreditation of item/system level performance models. In this role, AMSAA assists model developers with the development and execution of verification and validation plans to ensure new models and simulations provide credible information/results for decision making.

As the Army's Executive Agent for reliability and maintainability standardization improvement, AMSAA develops and implements reliability and maintainability acquisition reform initiatives. AMSAA develops and applies engineering approaches that assess the reliability of Army materiel and also provides recommendations on ways to improve reliability, thereby reducing the logistics footprint, reducing life cycle costs, and extending failure-free periods for deployed equipment. AMSAA's electronic and mechanical Physics of Failure (PoF) program pioneered the Army's involvement in utilizing computer-aided engineering tools in the analysis of root-cause failure mechanisms at the component level during the system design process. AMSAA's reliability engineering and PoF tools/analyses have been used extensively to support the design improvement of developmental and fielded systems used in Current Operations resulting in improved reliability, reduced Operational

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and Support costs, and reduced logistics expenditures and footprint. AMSAA in conjunction with the Army Evaluation Center has formed the Center for Reliability Growth (CRG), which is developing critical tools, methodology, policies, formal guidance, and educational materials need to help acquisition programs to achieve their required reliability during the acquisition process. The reliability improvements achieved for major weapon systems will translate into billions of dollars in operating and support cost savings across the life cycle.

AMSAA's unique analytical capabilities are supporting the Army Evaluation Center to assess and determine the essential analytical requirements to enhance Army evaluations and reduce extensive testing. AMSAA's support in this area improves evaluation products and result in better materiel solutions to the Warfighter. AMSAA assists various ACAT systems' evaluations and provides quick response analyses in suppor

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	19.864	18.078	18.512	-	18.512
Current President's Budget	20.970	18.078	19.669	-	19.669
Total Adjustments	1.106	-	1.157	-	1.157
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	1.200	-			
• SBIR/STTR Transfer	-0.094	-			
• Adjustments to Budget Years	-	-	1.157	-	1.157

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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
541: *MATERIEL SYS ANALYSIS*	20.970	18.078	19.669	-	19.669	20.294	20.386	19.919	20.140	Continuing	Continuing
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

This program element funds Department of the Army (DA) civilians at the Army Materiel Systems Analysis Activity (AMSAA) to conduct responsive and effective materiel systems analysis in support of senior Army decision making for equipping the U.S. Army. AMSAA conducts systems and engineering analyses to support Army decisions in technology; materiel acquisitions; and the design, development, fielding, and sustaining of Army weapon systems. As part of this mission, AMSAA develops and certifies systems performance data used in Army studies, and develops systems performance methodology and Modeling and Simulation (M&S).

AMSAA is the Army's center for item/system level performance analysis and certified data. In support of its materiel systems analysis mission, AMSAA analyzes the performance and combat effectiveness of conceptual, developmental, and fielded systems. Unique models and methodologies have been developed to predict critical performance variables, such as weapon accuracy, target acquisition, rate of fire, probability of inflicting catastrophic damage, and system reliability. AMSAA generates performance and effectiveness measures and ensures their standard use across major Army and Joint studies. AMSAA conducts and supports various systems analyses, such as: Analyses of Alternatives, system cost/performance tradeoffs, early science and technology tradeoffs, weapons mix analyses, system risk assessments, analytical support for Test and Evaluation, and requirements analyses. These analyses are used by the Army Research, Development and Engineering Command, Army Materiel Command, Program Executive Officers/Project Managers, DA staff/Assistant Secretary of the Army for Acquisition, Logistics, and Technology, and Department of Defense (DoD) leadership in making acquisition, procurement, and logistics decisions in order to provide quality equipment and procedures to the Soldier.

AMSAA's M&S capabilities support the development, linkage, and accreditation of live, virtual, and constructive simulations, and provide unique tools that support systems analysis of individual systems and the combined-arms environment. AMSAA maintains a significant number of models and simulations, most of which were developed in-house to address specific analytical voids. This M&S infrastructure provides a hierarchical modeling process that is unique to AMSAA and allows for a comprehensive performance and effectiveness prediction capability that can be utilized to make trade-off and investment decisions prior to extensive and expensive hardware testing of proposed systems/technologies for Current and Future Force efforts. AMSAA is the Army's executive agent for the verification, validation, and accreditation of item/system level performance models. In this role, AMSAA assists model developers with the development and execution of verification and validation plans to ensure new models and simulations provide credible information/results for decision making.

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extensively to support the design improvement of developmental and fielded systems used in Current Operations resulting in improved reliability, reduced Operational and Support costs, and reduced logistics expenditures and footprint.

AMSAA's unique analytical capabilities are supporting the Army Evaluation Command to assess and determine the essential analytical requirements to enhance Army evaluations and reduce extensive testing. AMSAA's support in this area improves evaluation products and result in better materiel solutions to the Warfighter. AMSAA assists various ACAT systems' evaluations and provides quick response analyses in support of rapid initiatives for Current Operations.

As the Army's center for materiel systems analysis, AMSAA provides the technical capability to support Army and DoD decision makers throughout the entire acquisition process in responding to analytical requirements across the full spectrum of materiel. AMSAA's unique in-house, consistent, integrated analytical capability is a critical asset that provides Army leadership with timely, unbiased, reliable, and high quality analysis to support complex decisions required for Army Transformation and Current Operations. AMSAA's integrated set of skills and tools are focused on its core mission to be responsive to the breadth and depth of systems analysis requirements critical in supporting Army decisions.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Materiel Systems Analysis	20.970	18.078	19.669
Articles:	0	0	
Description: These funds are used by the US Army Materiel Systems Analysis Activity (AMSAA) to conduct various materiel systems analysis efforts in support of senior Army decision makers during FY10-12. AMSAA will continue to conduct analyses, materiel systems performance data generation and certification, methodology development, Modeling and Simulation (M&S) development, and verification, validation, and accreditation. The accomplishments include performance and combat effectiveness analyses of materiel systems and technology base programs for the Department of Army, the Army Materiel Command, the Research, Development and Engineering Command, Program Executive Officers/Program Managers, the Training and Doctrine Command, the Army Service Component Commands, the Army Test and Evaluation Command, and the Office of the Secretary of Defense. These analyses form the basis for Analysis of Alternatives (AoAs), system cost/performance tradeoffs, early technology trade-offs, weapons/systems mix analyses, requirements analyses, technology insertion studies, reliability growth studies, and Physics of Failure (PoF) analyses.			
FY 2010 Accomplishments: Critical AMSAA analyses supported the following programs: Stryker variants, Ground Combat Vehicle (GCV), Joint Light Tactical Vehicle (JLTV), Mine-Resistant Ambush-Protected All-Terrain Vehicle (M-ATV), Army Modernization Spin-Off Systems, Ground Soldier System, Biometrics, Armed Aerial Scout, Sensor Fusion Systems, and Scorpion as well as numerous other ground and air combat, combat support and combat service support systems. Efforts also focused on enhancements to power and energy (soldier and vehicle) methodology, Improvised Explosive Device (IED) and Counter IED modeling, target acquisition methodology, sensor fusion modeling, mechanical and electronic PoF modeling, vehicle performance methodology, Active Protection System performance, System of Systems Communications Network Model development, non-lethal weapons			

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
performance and effectiveness estimation methodology, and the Infantry Warrior Simulation (IWARS), to include modeling operations in urban terrain. ***FY 2011 Plans:*** Critical AMSAA analyses are supporting Army Modernization programs and follow-on studies associated with the GCV, JLTV, Ground Soldier System, Armed Aerial Scout, the Joint Aerial Layer Network, the Joint Urban Test Capability, Information Operations analyses, Precision Artillery and Survivability analyses, and other current operations-related efforts. Initial efforts are being performed in support Irregular Warfare (IW) related tasks, analyses, and model enhancements. AMSAA is conducting initial planning efforts and beginning the standing-up an Army Center for Reliability Growth. Efforts are continuing to focus on constant enhancements to methodologies and M&S that are the foundation for accurate and timely analytical products and data (which include, enhancements to power and energy (soldier and vehicle) methodology, Improvised Explosive Device (IED) and Counter IED modeling, target acquisition methodology, sensor fusion modeling, mechanical and electronic PoF modeling, vehicle performance methodology, fuel consumption modeling, Active Protection System performance, System of Systems Communications Network Model development, non-lethal weapons performance and effectiveness estimation methodology, and the Infantry Warrior Simulation (IWARS), to include modeling operations in urban terrain). ***FY 2012 Plans:*** Critical AMSAA analyses will continue to support Army Modernization efforts and key milestone decision reviews. AMSAA will conduct follow-on studies for major Army programs as required and continue to provide essential certified weapons system performance data for Army studies as needed. Efforts will continue on IW-related tasks, analyses, and model enhancements. AMSAA will be fully operational as a key part of the Army Center for Reliability Growth (CRG). The CRG will develop critical tools, methodology, policies, formal guidance and educational materials needed to assist acquisition programs achieve and/or stay on their required reliability growth curves. AMSAA will continue to enhance the essential methodologies, tools, and M&S to facilitate accurate analytical products.			
Accomplishments/Planned Programs Subtotals	20.970	18.078	19.669

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.