

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)						February 2006		
BUDGET ACTIVITY 6 - Management support			PE NUMBER AND TITLE 0605604A - Survivability/Lethality Analysis				PROJECT 675	
COST (In Thousands)		FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate
675	Army Survivability Analysis & Evaluation Support	44104	41703	40780	40657	41184	42446	39029
<p><u>A. Mission Description and Budget Item Justification:</u> This project funds the investigation of the survivability, lethality and vulnerability (SLV) of designated Army systems to all battlefield threats. It supports transforming the Army to a highly effective mobile force depending on symmetry between Survivability, Lethality, Mobility, Manpower and Personnel Integration (MANPRINT), Deployability, and Sustainability. The challenge of the Army Transformation is to examine holistically the contribution of platforms to force effectiveness. This project provides lethality and survivability data of potential systems in the Stryker and Future Forces to achieve symmetric mix of force effectiveness. The analysis is integrated across all battlefield threats (i.e., conventional ballistic, electronic warfare, and directed energy). The results are used by each Project Manager (PM) and the Program Executive Officer (PEO) to direct weapon system development efforts and structure product improvement programs; by the Army Test and Evaluation Command's Army Evaluation Center (ATEC/AEC) when they provide system evaluations in support of milestone decisions; by the user to develop survivability/lethality requirements, doctrine and tactics; and by decision makers in formulating program/production decisions.</p> <p>Additionally this project supports survivability analysis, information warfare (IW), and information operations (IO) of Army communications, electronic equipment and digitized forces against friendly and enemy threats. Provides field threat environment support for Electronic Warfare Vulnerability Analysis (EWVA). Analyzes vulnerabilities of foreign threat weapons and command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) and Intelligence Electronic Warfare (IEW) systems to U.S. Army Electronic Warfare (EW) systems. Provides threat weapon electronic design data to countermeasure developers and technical capability information to the intelligence community. Supports Army initiatives in vulnerability reduction of C4I/IEW systems against battlefield threats, including IW. Provides analysis for understanding potential vulnerabilities of Digitized Force developmental systems. Supports Army Warfighting Experiments and associated Information Operations Vulnerability Assessments for Digitized Force Architecture. Supports vulnerability analysis of situational awareness data of the Transformation Force.</p> <p>Analysis includes survivability and vulnerability analysis of ground systems of the Stryker and Future Force for Army Transformation and other Army ground combat systems; Army air defense and missile defense systems; Army aviation systems and Unmanned Aerial Vehicles (UAV); Army fire support weapons (smart and conventional); Horizontal Technology Integration systems, Advanced Technology Demonstration initiatives, and proposed survivability enhancements to weapon platforms.</p>								
<u>Accomplishments/Planned Program</u>						<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>
Completed non-ballistic survivability/lethality analysis for Stryker variants/configurations. Conduct Stryker Mobile Gun System and Nuclear, Biological and Chemical Reconnaissance vehicle Live Fire Test and Evaluation (LFT&E) and non-ballistic survivability analysis. For these two variants, provide pre-shot predictions, perform damage assessments after live fire tests, post-shot analyses and provide technical data required by ATEC for the Systems Evaluation Reports.						2777	0	0
Conduct integrated survivability, lethality, and vulnerability analyses for Army Future Combat Systems (FCS). Initiate modeling, analysis and simulation efforts supporting the FCS program, to include Active Protection Systems (APS) and FCS Lethality. Contribute to the Development of the System of Systems analysis methodology for Unit of Action (UA) survivability. Investigate the vulnerability/survivability implications of FCS advanced technologies including new armors and hybrid electric propulsion systems. Develop the methodologies necessary to support the characterization and assessment of FCS platforms equipped with these systems. Aid FCS platform designers and technology suppliers to enhance the survivability of these technologies. Identify and manage Soldier						11774	12000	13080

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Survivability related issues during FCS system design to include fratricide prevention and crew protection. Support the planning and execution of the ballistic vulnerability and Title 10 LFT&E programs on the FCS, in conjunction with ATEC and Director, Operational Test & Evaluation (DOT&E). Conduct a ballistic vulnerability analysis on the initial Manned Ground Vehicle (MGV) platform design. Further support FCS program by providing documentation and briefings on survivability of concepts in support of the Program Design Review (PDR) in FY 2005.			
Conduct integrated survivability, lethality, and vulnerability analyses for aviation systems. Complete CH-47F LFT&E survivability evaluation. Prepare multi-threat survivability analysis data for CH-47F milestone C decision. Provide Blackhawk and Apache LFT&E support. Conduct EW vulnerability assessments for developmental U.S. Army munition systems such as Advanced Precision Kill Weapon System (APKWS), Intelligent Munition System (IMS) and Mid-Range Munition (MRM). Conduct ballistic survivability/lethality analysis for U.S. Army munitions systems to include APKWS, Spider, XM 982 Excalibur, MRM, Precision Guided Mortar Munition (PGMM), Guided Multiple Launch Rocket System (GMLRS) w/Dual Purpose Improved Conventional Munitions (DPICM), GMLRS Unitary, Compact Kinetic Energy Missile (CKEM), Javelin pre-planned product improvement, and XM307. Provide Global Positioning System jamming analysis for U.S. Army munition systems to include Excalibur, GMLRS w/DPICM and GMLRS Unitary. Conduct obscurant and atmospheric effects survivability analysis for U.S. Army munitions systems. Support LFT&E of GMLRS Unitary and operational testing for GMLRS w/DPICM. Conduct initial lethality estimates on the Non-Line-of-Sight Launcher System, and Intelligent Munitions System (IMS).	7347	7329	6900
Conduct integrated electronic and IW effects survivability analysis on command and control systems, and various Army weapon platforms as they integrate C4ISR components with internal information/computer processors controlling automotive, flight, fire control and sensor functions. This effort supports the full set of Army Battle Command Systems: Force XXI Battle Command, Brigade & Below, Advanced Field Artillery Tactical Data System, Maneuver Control System, Forward Area Air Defense-C2I, All Source Analysis System, Combat Service Support Control System, and Advanced Missile Defense Warning System. Continue to expand IW vulnerability assessment program to determine exploitable weakness in the Digitized Forces (including FCS) and recommend mitigating solutions. Focus on processor components of the Stryker Force to determine the limitations of system performance in an IW threat environment. Conduct integrated electronic and IO survivability analysis for Army communications systems such as Warfighter Integrated Network-Terrestrial, the Near Term Digital Radio, Joint Tactical Radio System (JTRS), Single Channel Anti-Jam Man-Portable Terminal, Secure Mobile Anti-Jam Reliable Tactical Terminal and Single Channel Ground and Airborne Radio System Advanced System Improvement Program. Conduct integrated electronic and IO survivability analysis for C2 systems integral to air and missile defense systems. Conduct integrated electronic and IO survivability analysis for Global Positioning System components as they are integrated into Army munitions systems. Includes update of information warfare vulnerability database, and vulnerability analyses of Tactical Internet components to radio frequency directed energy weapons (RFDEW). Develop modeling and simulation to examine impacts of EW and IW attacks on the survivability of FCS. Conduct EW and IW investigations of the JTRS design via supplied simulations and emulations.	12707	12057	15463
Conduct integrated survivability, lethality, vulnerability analyses for developmental air defense and missile defense systems, pre-planned product improvements of current systems, and recently fielded systems. Systems to be addressed include Ballistic Missile Defense System (BMDS), Theater High Altitude Air Defense (THAAD), Patriot, Medium Extended Air Defense System (MEADS), Surface-Launched Advanced Medium-Range Air-to-Air Missile (SLAMRAAM), Joint Land Attack Cruise Missile Defense Elevated Netted Sensor System (JLENS), and Sentinel. Provide interim survivability reports. Recommend survivability enhancements. Project also funds Anti-Radiation Missile (ARM) Counter-Arm efforts that assess threat technologies against THAAD and Ground-Based Midcourse Defense, Patriot, MEADS, and Forward Area Air Defense-C21 (FAAD-C21) ground based sensors. Includes work on Focal Plane Array Countermeasures (FPACM) (Project Agreement Partner: United Kingdom): Produce final assessment report for FPACM. Assist in transitioning to new FPACM agreement with the Air Force. Continue support of Missile Defense Agency's (MDA) Ballistic Missile	5299	5317	5337

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Defense System (BMDS) through MDA Black Team participation which includes postulation of potential countermeasure threats, assessment of countermeasure impacts on BMDS systems and providing communications jamming and Information Assurance inputs to the Adversary Capability Document. Support development of BMDS Test Bed.Design and develop hardware to support the software research and development for the Patriot Advanced Capability-3 Seeker electronic countermeasures/electronic counter-countermeasures algorithms.			
System of Systems Survivability Simulation - develop a System of Systems Survivability engineering model used with the Combined Arms and Support Task Force Evaluation Model (CASTFOREM) and its successor, Combat XXI. The System of Systems Survivability model provides details of how combat outcomes are dependant on understanding the way quality of military decision-making is conditioned by information flow on the battlefield. This model will advance the understanding of Information Operations and Information Warfare.	4200	1000	0
Complete engineering design, site preparation work and concrete pad construction for Rotocraft Survivability Assessment Facility.	0	4000	0
Total	44104	41703	40780

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B. Program Change Summary	FY 2005	FY 2006	FY 2007	
Previous President's Budget (FY 2006)	47543	38306	40005	
Current BES/President's Budget (FY 2007)	44104	41703	40780	
Total Adjustments	-3439	3397	775	
Congressional Program Reductions		-183		
Congressional Rescissions		-420		
Congressional Increases		4000		
Reprogrammings	-3439			
SBIR/STTR Transfer				
Adjustments to Budget Years			775	