

UNCLASSIFIED

Exhibit R-2, PB 2011 Army RDT&E Budget Item Justification									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE							
2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)				PE 0603005A: Combat Vehicle and Automotive Advanced Technology							
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	270.195	240.190	89.499	0.000	89.499	105.848	112.784	125.391	144.645	0	1,178.051
221: COMBAT VEH SURVIVABLTY	36.723	22.320	24.897	0.000	24.897	38.950	47.895	51.283	58.843	Continuing	Continuing
441: COMBAT VEHICLE MOBILTY	38.969	46.797	42.154	0.000	42.154	44.258	42.848	47.070	53.278	Continuing	Continuing
497: COMBAT VEHICLE ELECTRO	7.249	7.474	7.507	0.000	7.507	7.659	7.789	8.923	10.039	Continuing	Continuing
515: ROBOTIC GROUND SYSTEMS	9.864	10.099	10.637	0.000	10.637	10.703	10.802	14.957	19.086	Continuing	Continuing
533: Ground Vehicle Demonstrations	124.301	132.685	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
53D: NAC Demonstration Initiatives (CA)	41.067	18.384	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
53G: FUTURE COMBAT SYSTEMS (FCS)	11.368	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
C66: DC66	0.654	2.431	4.304	0.000	4.304	4.278	3.450	3.158	3.399	Continuing	Continuing
A. Mission Description and Budget Item Justification											
The objective of this program element (PE) is to mature and demonstrate vehicle automotive technologies that enable Army transformation to a lighter, more mobile and more survivable Future Force. This PE supports maturation and demonstration of enabling component and subsystems for ground combat/tactical vehicles in the areas of survivability (project 221), mobility (project 441), combat vehicle electronics (project 497), and robotic ground systems (project 515). Project 53G matures and demonstrates technology in support of the future ground vehicle programs. Projects 533 and 53D fund congressional special interest items. Project C66 supports classified activities. Properly accessed individuals can obtain further information from the ASA(ALT) Special Programs Office. Work in this PE is related to, and fully coordinated with, PE 0602601A (Combat Vehicle and Automotive Technology), 0602618A (Ballistics Technology), 0602120A (Sensors and Electronic Survivability, Robotics Technology), 0602105A (Materials), and 0602705A (Battery/Ind Power Technology). Work in this PE is coordinated with the US Marine Corps, the Naval Surface Warfare Center, the Naval Research Laboratory, Air Force Armaments Command, and other ground vehicle developers within the Departments of Energy, Commerce, and Transportation as well as DARPA. 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 PE is performed by the Tank Automotive Research, Development, and Engineering Center (TARDEC), Warren, Michigan.											

UNCLASSIFIED

R-1 Line Item #33

Page 1 of 90

1209 of 1536

UNCLASSIFIED

Exhibit R-2, PB 2011 Army RDT&E Budget Item Justification				DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE			
2040: Research, Development, Test & Evaluation, Army		PE 0603005A: Combat Vehicle and Automotive Advanced Technology			
BA 3: Advanced Technology Development (ATD)					
B. Program Change Summary (\$ in Millions)					
	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	263.879	89.586	92.778	0.000	92.778
Current President's Budget	270.195	240.190	89.499	0.000	89.499
Total Adjustments	6.316	150.604	-3.279	0.000	-3.279
• Congressional General Reductions		-1.256			
• Congressional Directed Reductions					
• Congressional Rescissions		0.000			
• Congressional Adds		151.860			
• Congressional Directed Transfers					
• Reprogrammings	13.250	0.000			
• SBIR/STTR Transfer	-6.934	0.000			
• Adjustments to Budget Years	0.000	0.000	-3.279	0.000	-3.279
Change Summary Explanation					
FY10 Congressionally directed increases.					

UNCLASSIFIED

R-1 Line Item #33

Page 2 of 90

1210 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>				R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive Advanced Technology</i>				PROJECT 221: <i>COMBAT VEH SURVIVABLTY</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
221: <i>COMBAT VEH SURVIVABLTY</i>	36.723	22.320	24.897	0.000	24.897	38.950	47.895	51.283	58.843	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project matures and demonstrates survivability technologies such as advanced armors, active protection systems (APS), and safety devices. Armors are currently being developed to meet ground vehicle program thresholds and move towards ground combat/tactical vehicle objectives. Additionally, this project focuses on integrating and demonstrating active protection technologies and vision protection to defeat optical attacks. This project looks at the integration of survivability technologies that enable entire protection suites to provide greater survivability than armor alone. 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 Tank Automotive Research, Development, and Engineering Center (TARDEC), Warren, Michigan; Army Research Laboratory (ARL), Aberdeen Proving Ground, Maryland; Armaments Research, Development, and Engineering Center (ARDEC), Picatinny, New Jersey; and the Aviation and Missile Research, Development, and Engineering Center (AMRDEC), Huntsville.

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

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1 Active Protection Systems (APS) against Kinetic Energy (KE) threats: This effort conducts essential trade studies, technical evaluations, and demonstrations of APS components/subsystems designed for protection against KE penetrators. In FY09, updated component and system design specifications and finalized all system interfaces; completed integration support of ARDEC's warhead and fuse package and AMRDEC's interceptor; and tested warheads in support of KE APS final demonstration. In FY10, support final KE APS demonstration with interceptor/system testing, demonstration, and analysis; complete component and system design specifications and finalize all system interfaces. Related work is also being conducted under Program Elements (PE) 0602624A, 0603004A, and 0603313A. <i>FY 2009 Accomplishments:</i> FY 2009	9.652	3.695	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 3 of 90

1211 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 221: COMBAT VEH SURVIVABLTY		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #2 Tactical Wheeled Vehicle (TWV) Survivability: This effort focuses on maturing and demonstrating viable integrated survivability suites that can be tailored to meet current and future threats for light, medium, and heavy tactical wheeled vehicles. In FY09, conducted extensive demonstrations on an expanded set of integrated survivability suites on demonstration vehicle(s) to verify and validate the level of protection achieved, system durability and the impact of the added weight, volume, and power on vehicle performance; completed analysis tool to simulate the effects of mine blast impacts on vehicle and crew; and fabricated and integrated advanced armors. In FY10, begin tactical platform active protection prototype system integration; conduct live fire blast and ballistic testing; mobility/durability tests on demonstration vehicles will also be conducted; assess emerging technologies against current and emerging threats to optimize suites of integrated survivability technologies including high performance ballistic materials, active protection systems, and common display; integrate suite options and deliver test report, lessons learned, and recommendations to ground combat and tactical vehicle developers. In FY11, will utilize requirements analysis, technology assessments, concept integration studies based upon emerging technology, and lessons learned to apply a systems engineering evaluation approach which will provide a holistic, platform-level process for the maturation of the integrated survivability suites; will mature advanced armor to include: opaque, transparent, and underbody kits; will integrate advanced tactical vehicle active protection; and will establish a concept for an optimized survivability suite based upon a down selection process. Related work is also being performed under Program Elements (PE) 0602601A, 0602618A, and 0602105A		10.744	10.525	11.035	0.000	11.035

UNCLASSIFIED

R-1 Line Item #33

Page 4 of 90

1212 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 221: COMBAT VEH SURVIVABLTY		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #3 Vision Protection: This effort matures and demonstrates treatments to optical systems that provide protection from frequency-agile laser weapons. In FY09, completed and validated the performance of agile laser protection in future force combat vehicle-type navigation camera and optical fire control breadboards. In FY10, integrate agile laser protection into a prototype medium range Electro-Optical/Infrared (EO/IR) sensor; integrate agile laser protection into a combat vehicle driver's camera. In FY11, will evaluate and refine an architecture that will enable a large focal plane optical switch to be implemented; will conduct lab testing of laser protected fire control and driver's cameras; and will design and implement a liquid optical limiter handling system. Related work is also being performed in Program Elements (PE) 0602120A, 0602705A, 0602786A and 0602712A. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010		3.737	2.450	5.339	0.000	5.339

UNCLASSIFIED

R-1 Line Item #33

Page 5 of 90

1213 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 221: COMBAT VEH SURVIVABLTY		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #4 Armor/Mine Protection: This effort integrates and tests advanced ballistic protection including smart and ceramic armors, advanced composite and laminate structures, and advanced transparent armor formulations. In FY09, accelerated maturation and demonstration of combat and tactical wheeled vehicle armor recipes and improved mine kit designs against objective threats while reducing armor weights; and furthered the development of platform-level mine-blast response modeling and simulation tools to include crew/occupant response to support system level analysis. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		12.590	0.000	0.000	0.000	0.000
Program #5		0.000	1.973	2.498	0.000	2.498

UNCLASSIFIED

R-1 Line Item #33

Page 6 of 90

1214 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 221: COMBAT VEH SURVIVABLTY		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
High Performance Lightweight Track (Blast Mitigation): This effort improves lightweight track durability and survivability. In FY10, use modeling and simulation to perform blast event analysis on two high performance lightweight track prototypes; and exploit analysis results to optimize track design for mine blast/IED survivability. In FY11, will integrate track solutions, fabricate prototypes and demonstrate blast protection. This effort is done in coordination with related efforts in PE 0603005A projects 441 and 497. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO						
Program #6 Armor Integration: This effort integrates and demonstrates passive, reactive, and electromagnetic technologies for use in active protection armor applications to defeat objective and emerging kinetic energy and chemical energy threats. In FY10, mature and validate passive and reactive armor solutions from PE 0602601A/Project C05 and PE 0602618A that defeat objective and emerging threats. In FY11, will evaluate and downselect validated armor solutions with respect to weight and performance against objective and emerging threats; will determine system requirements for near/midterm deployment of active defeat technologies to defeat rocket propelled grenades, mortars, and anti-tank guided missiles; and will compare active armor solutions to existing active protection system solutions with respect to size, weight, power, cost, and effectiveness.		0.000	1.281	1.534	0.000	1.534

UNCLASSIFIED

R-1 Line Item #33

Page 7 of 90

1215 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 221: COMBAT VEH SURVIVABLTY		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #7 Vehicle Integration Laboratory: This effort provides for continuous improvements to ground vehicles to include technology trades, integration, concepts and configuration management designs. In FY10, develop Modeling and Simulation (M&S) framework to assess system integration impacts for emerging technologies (i.e. , advanced engines, suspensions, survivability technologies) for ground combat and tactical vehicle platforms; begin lifetime environmental and stability studies of laser protection systems for tactical and ground combat vehicles. In FY11, will integrate prototype tactical wheeled vehicle active protection systems onto a surrogate platform and conduct performance testing; will evaluate integration techniques and concepts for advanced armor kits that defeat objective and emerging threats for ground and tactical vehicle fleets; and will conduct system-level testing of combined fire protection technologies on representative ground vehicle platforms. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010		0.000	2.166	4.491	0.000	4.491

UNCLASSIFIED

R-1 Line Item #33

Page 8 of 90

1216 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive Advanced Technology</i>		PROJECT 221: <i>COMBAT VEH SURVIVABLTY</i>	
<u>B. Accomplishments/Planned Program (\$ in Millions)</u>					
	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
<i>Base FY 2011 Plans:</i> FY 2011 Base <i>OCO FY 2011 Plans:</i> FY 2011 OCO					
Program #8 Small Business Innovative Research/Small Business Technology Transfer Programs. <i>FY 2009 Accomplishments:</i> FY 2009 <i>FY 2010 Plans:</i> FY 2010 <i>Base FY 2011 Plans:</i> FY 2011 Base <i>OCO FY 2011 Plans:</i> FY 2011 OCO	0.000	0.230	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	36.723	22.320	24.897	0.000	24.897
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A					
<u>D. Acquisition Strategy</u> N/A					

UNCLASSIFIED

R-1 Line Item #33

Page 9 of 90

1217 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>	R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive Advanced Technology</i>	PROJECT 221: <i>COMBAT VEH SURVIVABLTY</i>
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.		

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>				R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive Advanced Technology</i>				PROJECT 441: <i>COMBAT VEHICLE MOBILITY</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
441: <i>COMBAT VEHICLE MOBILITY</i>	38.969	46.797	42.154	0.000	42.154	44.258	42.848	47.070	53.278	Continuing	Continuing
<u>A. Mission Description and Budget Item Justification</u> This project matures and demonstrates advanced mobility and electric technologies for propulsion, power, and electrical components and subsystems. Mobility technologies are being developed to meet program thresholds and move towards ground combat/tactical vehicle objectives. Additionally this program looks at the integration of mobility technologies to enable lightweight, agile, deployable, fuel efficient, and survivable ground vehicles. 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 Tank Automotive Research, Development, and Engineering Center (TARDEC), Warren, MI, in conjunction with Army Research Laboratory (ARL), Adelphi, MD.											
<u>B. Accomplishments/Planned Program (\$ in Millions)</u>											
						FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011	
Program #1 Hybrid Electric Vehicle (HEV) Propulsion and Power & Energy (P&E) System Integration Lab (SIL): This effort matures and demonstrates power and energy component technologies and assesses HEV performance benefits and burdens. In FY09, upgraded electronic architecture and thermal management system on the prototype combat vehicle chassis for continued evaluation in a space constrained vehicle environment; and utilized user-developed scenarios to establish baseline performance of prototype combat vehicle chassis and integrated hybrid electric propulsion system. In FY10, support testing of HEV components and hybrid electric system for combat platforms; perform thermal management tests of components that increase heat transfer capabilities of onboard power electronics, and perform evaluation of high temperature power electronics. In FY11, will mature and demonstrate HEV components and system integration capabilities in simulated field conditions to solve user identified-technical issues and evaluate high temperature/high power electronic devices. <i>FY 2009 Accomplishments:</i> FY 2009						7.046	4.296	1.974	0.000	1.974	

UNCLASSIFIED

R-1 Line Item #33

Page 11 of 90

1219 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 441: COMBAT VEHICLE MOBILTY		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #2		0.000	2.761	2.402	0.000	2.402
Ground Systems Power Evaluation: This effort matures and demonstrates power and energy components for propulsion, control systems, communications, life support, electric weapons, and protection systems. In FY10, demonstrate high temperature power electronics, advanced motors and generator systems; mature advanced diesel engines for JP-8 compatibility and increased thermal efficiency; and mature and demonstrate components, including traction motor inverters, energy converters and motor generator concepts in integrated hybrid electric (HE) systems for wheeled vehicles. In FY11, will continue optimization of higher temperature power electronics for use in wheeled vehicle platforms; and will continue the optimization of HE systems for wheeled vehicle system upgrades, as well as advanced motors and generators that offer onboard and export power generation.						
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						

UNCLASSIFIED

R-1 Line Item #33

Page 12 of 90

1220 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 441: COMBAT VEHICLE MOBILTY		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
OCO FY 2011 Plans: FY 2011 OCO						
Program #3 Hybrid Electric Vehicle (HEV) Demonstration and Assessment: This effort refines and demonstrates the maturity of HEVs for military applications, and develops Modeling and Simulation (M&S) tools to predict fuel economy and performance characteristics. In FY09, continued analysis of HEVs to focus on M&S excursions with actual demonstrations to validate models and expand lessons learned to quantify fuel economy and performance of Hybrid Demonstrator Vehicles. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		4.165	0.000	0.000	0.000	0.000
Program #4 Pulse Power: This effort matures and demonstrates compact components and subsystems that enable significantly improved survivability and lethality applications. In FY09, developed active cooling for the High Energy Laser (HEL) pulse power supply allowing greater operational time and increase power/weight efficiency by 40 percent; and developed high voltage-reversal capacitors with extended durability and increased capacity. In FY10, demonstrate Second Generation SiC switch reliability technology at threshold metrics defined by Future Force		3.932	4.929	10.889	0.000	10.889

UNCLASSIFIED

R-1 Line Item #33

Page 13 of 90

1221 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 441: COMBAT VEHICLE MOBILTY	
B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
concepts; refine the Programmable Pulse Power Supply for field testing at threshold metrics; and refine designs for active cooling Programmable Pulse Power Supply for HEL. In FY11, will demonstrate Advanced Pulse forming card for the Programmable Pulse Power Supply at objective metrics defined by Ground Combat Vehicle; and will demonstrate SiC switch at objective metrics defined by Ground Combat Vehicle. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO					
Program #5 Advanced Lightweight Track: This effort improves and optimizes lightweight track technology through utilization of high performance elastomers and component design with the goal of improving track durability and survivability. In FY09, fabricated Hybrid Lightweight Track and conducted vehicle test for durability, mobility, and survivability capabilities to demonstrate a sufficient technology maturity for transition to Future Force manned ground vehicles. In FY10, mature, fabricate and conduct preliminary vehicle testing of advanced lightweight track systems. Design improvements will include track durability, survivability, flame resistance while decreasing system weight. In FY11, will refine, fabricate, and conduct vehicle performance and durability testing of the advanced lightweight track systems. This effort is done in coordination with related efforts in PE 0603005A, projects 221 and 497.	1.528	1.833	4.331	0.000	4.331

UNCLASSIFIED

R-1 Line Item #33

Page 14 of 90

1222 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 441: COMBAT VEHICLE MOBILTY				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #6 Fuel Cell Power: This effort develops a fuel cell technology as an auxiliary power unit for providing electrical power to ground combat vehicles. In FY10, identify ground vehicle system power requirements and space available for fuel cell applications; create system layout map and perform modeling and simulation; and mature and demonstrate fuel cell system components. This effort is done in coordination with efforts in PE 0602601A , Project H91.		0.000	4.439	0.000	0.000	0.000
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						

UNCLASSIFIED

R-1 Line Item #33

Page 15 of 90

1223 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 441: COMBAT VEHICLE MOBILTY		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
OCO FY 2011 Plans: FY 2011 OCO						
Program #7 JP-8 Fuel Cell Reformer System: This effort identifies and demonstrates fuel cell technology, that when integrated with a JP-8 reformer, creates an Auxiliary Power Unit (APU). In FY10, improve the JP-8 reformer system model to optimize the layout design and mature system process models; identify all JP-8 reformer components and technologies that will be used; and begin reformer component characterization to ensure operational parameters will be met. In FY11, will begin integration demonstration of essential reformer components; will characterize performance of components when integrated in complete reformer system; and will begin physical assembly of a JP-8 reformation system. This effort is done in coordination with efforts in PE 0602601A, Project H91. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	4.139	3.920	0.000	3.920
Program #8 Fuel Efficiency ground vehicle Demonstrator (FED): This effort focuses on demonstrating the viability of achieving significant decreases in fuel consumption without sacrificing tactical vehicle performance or capability.		9.191	4.748	4.839	0.000	4.839

UNCLASSIFIED

R-1 Line Item #33

Page 16 of 90

1224 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 441: COMBAT VEHICLE MOBILTY		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
In FY09, performed extensive modeling and simulation to identify opportunities to implement technologies. Began detailed design of demonstrator(s) using the identified technologies. In FY10, complete design of demonstrator(s); and begin fabrication/integration of the demonstrator(s); conduct subsystem testing, if necessary. In FY11, will complete fabrication of demonstrator(s) and begin test process to validate the findings of the modeling and simulation; will validate successfully tested technologies for transition to Program Manger (PM). FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO						
Program #9 Propulsion-Prime Power: This effort provides propulsion and power technologies for tactical wheeled vehicles. In FY09, matured and demonstrated hybrid electric components for tactical wheeled vehicle applications; modified, optimized, and evaluated commercially available engines to enable JP-8 fuel usage; demonstrated, and refined Magneto-Rheological (MR) Suspension on Stryker Mobile Gun System (MGS); and performed suspension proof-of-principle test on Stryker. In FY10, complete performance and durability testing of modified commercial diesel engines; integrate and evaluate compact advanced high power density, high operating temperature, components on vehicle platforms; ruggedize MR suspension hardware and software for endurance testing on Stryker; and perform endurance testing. In FY11, will complete testing of the MR suspension on a Stryker vehicle; will perform advanced development and integration of sensors and control algorithms for closed-		7.223	7.845	7.660	0.000	7.660

UNCLASSIFIED

R-1 Line Item #33

Page 17 of 90

1225 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 441: COMBAT VEHICLE MOBILTY				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
loop control of diesel engines; will perform vehicle noise analysis; will improve control strategy for powertrain; will evaluate and select power generation components. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO						
Program #10 Power and Thermal Management: This effort demonstrates power and thermal management components and control strategies to meet objective tactical and combat vehicle power requirements. In FY09, matured and demonstrated intelligent power management components and control strategies on system/demo platform. In FY10, mature and demonstrate intelligent power management utilizing Artificial Intelligence (AI) to optimize vehicle control strategies and provide data for Condition Based Maintenance (CBM); and test, evaluate and demonstrate power and thermal management systems in a relevant laboratory environment. In FY11, will investigate optimal strategy for combining power and thermal management components into a system architecture. This effort is done in coordination with efforts in PE 0602601A, Project H91. FY 2009 Accomplishments: FY 2009		2.706	4.860	1.293	0.000	1.293

UNCLASSIFIED

R-1 Line Item #33

Page 18 of 90

1226 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 441: COMBAT VEHICLE MOBILTY		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #11 Non-primary Power Sources (NPS): This effort demonstrates component technologies for energy storage and generation. In FY09, performed laboratory assessment of several advanced high energy/power density battery systems to gauge their suitability for final NPS hardware; and demonstrated advanced power generation technologies to meet NPS requirements. In FY10, integrate power generation and energy storage system into advanced power and energy vehicle architecture system; and demonstrate improved engine-off vehicle performance on system demonstrator for silent watch. In FY11, will mature electrochemical cells, modules, and batteries; will demonstrate and refine hybrid battery systems. This effort is done in coordination with efforts in PE 0602601A, Project H91. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base		3.178	5.700	0.921	0.000	0.921

UNCLASSIFIED

R-1 Line Item #33

Page 19 of 90

1227 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 441: COMBAT VEHICLE MOBILTY		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
OCO FY 2011 Plans: FY 2011 OCO						
Program #12 Force Projection: This effort will focus on reducing the logistics footprint by maturing water generation, recovery, purification, reuse and quality monitoring technologies; and maturing a single, common powertrain lubricant that will serve as engine oil, transmission fluid, and hydraulic fluid for all combat and tactical equipment. In FY11, will conduct field evaluation and military utility assessment of water from air demonstrators; will integrate basic in-line monitoring demonstration technology into purification systems and will design and fabricate advanced hand held monitoring technology for water treatment process monitoring; will develop water reuse technology; will complete laboratory and engine testing and will initiate field evaluation of the single powertrain lubricant. This effort is done in coordination with efforts in PE 0602601A, project H91. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	0.000	3.925	0.000	3.925
Program #13 Small Business Innovative Research/Small Business Technology Transfer Programs.		0.000	1.247	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 20 of 90

1228 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive Advanced Technology</i>		PROJECT 441: <i>COMBAT VEHICLE MOBILITY</i>	
B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
<i>FY 2009 Accomplishments:</i> FY 2009					
<i>FY 2010 Plans:</i> FY 2010					
<i>Base FY 2011 Plans:</i> FY 2011 Base					
<i>OCO FY 2011 Plans:</i> FY 2011 OCO					
Accomplishments/Planned Programs Subtotals	38.969	46.797	42.154	0.000	42.154
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.					

UNCLASSIFIED

R-1 Line Item #33

Page 21 of 90

1229 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>				R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive Advanced Technology</i>				PROJECT 497: <i>COMBAT VEHICLE ELECTRO</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
497: <i>COMBAT VEHICLE ELECTRO</i>	7.249	7.474	7.507	0.000	7.507	7.659	7.789	8.923	10.039	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project matures, integrates, and demonstrates vehicle electronics hardware (displays, sensors, communications systems, and vehicle command/control/driving mechanisms) and software that result in increased crew efficiencies, performance, and/or reduced crew size, and reductions in vehicle maintenance costs. The project advances open system architectures for ground combat vehicles that allow more efficient crew stations to be adapted for a variety of ground platforms. Technical challenges include: increased levels of automation for both manned and unmanned systems, advanced user interfaces that support improved/increased span of control for robotic operations and collaborative vehicle operations, workload management, reliability of driving aids and commander's decision aids, and embedded simulation for battlefield visualization and fully integrated virtual test/evaluation. Additionally this project matures and demonstrates mobility technologies that reduce the weight as well as the operation and sustainment of ground vehicles. This work is performed in conjunction with Robotics Collaboration effort described in project 515. The Robotics Collaboration and Intelligent Secure Mobility Work (ISM) work is performed in close cooperation with the Army Soldier Battle Lab. The cited work is consistent with Strategic Planning Guidance, the Army Science and Technology Master Plan (ASTMP), the Army Modernization Plan, and the Defense Technology Area Plan (DTAP). Work in this project is performed by the Tank Automotive Research, Development, and Engineering Center (TARDEC), Warren, MI, in conjunction with Army Research Laboratory - Human Resources Engineering Directorate (ARL-HRED), Aberdeen, MD.

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

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1 Improved Mobility and Operations Performance through Autonomous Technologies: This effort matures indirect vision technologies to provide the Soldier with full hemispherical situational awareness in closed hatched vehicle operations. In FY09, defined the mobility & situational awareness performance/limitations of current indirect vision systems; conducted task and workflow analysis for the mobility and local situational awareness tasks of a vehicle crew; identified key cueing technologies for Soldiers that are dismounting to provide local situational awareness; analyzed existing crewstations and software for a baseline mobility and situational awareness task workload experiment; and designed and analyzed experiments on eye-tracking technologies for operational environments. In FY10, refine enhanced crewstations and software based on mobility and local situational awareness tasks and workload; mature local situational awareness warfighter machine interface for dismounting	6.277	6.365	6.534	0.000	6.534

UNCLASSIFIED

R-1 Line Item #33

Page 22 of 90

1230 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 497: COMBAT VEHICLE ELECTRO		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Soldiers and conduct experiment to assess impact of dismount information tools on local situational awareness; integrate enhanced crew station 360/90 (day/night) local situational awareness, assisted mobility, and soldier monitoring/state classification technologies with surrogate platform; and analyze results of the experiments to capture physiological and physical data from mounted soldiers in operational environments. In FY11, will integrate driver assist technologies and mounted Soldier monitoring, along with the local situational awareness system for dismounting Soldiers will integrate motion based cueing, video capture with closed hatch 360/90 Electro-Optic Indirect Vision (EOIV) system; and will conduct warfighter assessment and engineering evaluations to collect enhanced quantitative performance level understanding of future EOIV operations. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO						
Program #2 Enhanced Vehicle Technologies to Improve Lightweight Track Reliability: This effort will improve/optimize lightweight segmented band track technology through utilization of high performance elastomers and design with the goal of improving track durability. In FY09, analyzed data of Failure Mode and Effects Criticality Analysis (FMECA) for High Performance Light-weight Track and a representative current force or baseline legacy counterpart. Analyzed data gaps to identify possible sensors and/or indicators that assisted in determining the state of health of components/subsystems that are primary cost drivers of track systems. In FY10, validate a		0.972	0.922	0.973	0.000	0.973

UNCLASSIFIED

R-1 Line Item #33

Page 23 of 90

1231 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 497: COMBAT VEHICLE ELECTRO		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
track system diagnostic model to verify dynamic loads and effects of changes in the system; collect track system vehicle test data and investigate features and conditions in the data that correlate to failure modes; and perform a limited correlation exercise between diagnostic model, bench test, and track system test data to assess ability to predict system behaviors and/or failures. In FY11, will identify and demonstrate health monitoring systems for track applications; will identify and mature diagnostic and prognostic algorithms to report health predictions and future failures on track system components; and will develop a health monitoring strategy for track systems. This effort is done in coordination with related efforts in PE 0603005A projects 221 and 441.						
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #3 Small Business Innovative Research/Small Business Technology Transfer Programs.		0.000	0.187	0.000	0.000	0.000
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						

UNCLASSIFIED

R-1 Line Item #33

Page 24 of 90

1232 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010				
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive Advanced Technology</i>		PROJECT 497: <i>COMBAT VEHICLE ELECTRO</i>				
<u>B. Accomplishments/Planned Program (\$ in Millions)</u>								
				FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
<i>Base FY 2011 Plans:</i> FY 2011 Base								
<i>OCO FY 2011 Plans:</i> FY 2011 OCO								
Accomplishments/Planned Programs Subtotals				7.249	7.474	7.507	0.000	7.507
<u>C. Other Program Funding Summary (\$ in Millions)</u>								
N/A								
<u>D. Acquisition Strategy</u>								
N/A								
<u>E. Performance Metrics</u>								
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.								

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>				R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive Advanced Technology</i>				PROJECT 515: <i>ROBOTIC GROUND SYSTEMS</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
515: <i>ROBOTIC GROUND SYSTEMS</i>	9.864	10.099	10.637	0.000	10.637	10.703	10.802	14.957	19.086	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project matures and demonstrates unmanned ground vehicle technologies. The main focus is on integrating and demonstrating in relevant environments sensor technologies, perception hardware and software, and robotic control technologies that enable Unmanned Ground Vehicle (UGV) systems to maneuver on- and off-road at militarily significant speeds with minimal human intervention, thereby enabling the Soldier to perform other mission tasks. Challenges addressed include: obstacle avoidance, overcoming perception limitations, intelligent situational behaviors, command and control by Soldier operators, frequency of human intervention, operations in adverse weather, and robots protecting themselves and their surroundings from intruders. Mature technologies are incorporated in UGV technology demonstrators so that performance can be evaluated for tactical maneuver and sustainment applications. Work done in this project is complementary to the Robotics Collaboration effort described in project 497 and the Robotic Vehicle Control Architecture effort described in 53G. The approach builds upon, complements, and does not duplicate previous and ongoing investments conducted under the Joint Robotics Program Office and the Defense Advanced Research Projects Agency, in program element (PE) 0602601A, project H91 (Ground Vehicle Technology) and by the Army Research Laboratory (ARL) PE 0602120A (Sensors and Electronic Survivability). 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 Tank Automotive Research, Development, and Engineering Center (TARDEC), Warren, MI, in collaboration with the Army Research Laboratory (ARL), Adelphi and Aberdeen Proving Ground, MD.

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

	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1 Safe Operations of Unmanned systems for Reconnaissance: This effort demonstrates perception, control and tactical behavior technologies to safely conduct urban operations. In FY09, evaluated baseline behaviors that enabled Unmanned Ground Vehicles (UGVs) to safely navigate around people and other vehicles in a realistic military testing environment; evaluated specialized classification algorithms for sensor and algorithm fusion; evaluated machine learning and adaptive tactical behaviors; investigated situational awareness and operational procedures to assure safe UGV employment across anticipated missions; assisted in the development of UGV safety and testing procedures; and investigated and evaluated Modeling and Simulation (M&S) tools to evaluate perception/control algorithms and human-robot interaction. In FY10, provide quantitative performance data	5.464	5.098	10.637	0.000	10.637

UNCLASSIFIED

R-1 Line Item #33

Page 26 of 90

1234 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 515: ROBOTIC GROUND SYSTEMS		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
based on demonstrations that enable development of Techniques, Tactics and Procedures; develop mission-focused tactical behaviors; and develop and conduct initial warfighter assessment and engineering evaluations including evaluation of combined mobility/mission workload for UGVs and Unmanned Air Vehicles (UAVs). In FY11, will integrate and evaluate behaviors that enable UGVs to navigate safely around people and other vehicles in a realistic military testing environment; will integrate situational awareness and operational procedures to assure safe UGV employment across anticipated missions; will demonstrate tactical behaviors focused on mission execution; will integrate specialized classification algorithms for sensor and algorithm fusion; will increase capabilities of M&S tools to evaluate perception/control algorithms and human-robot interaction; and will evaluate sensors and tactical behaviors that enable the use of UGVs to assist in the security of maneuver elements (i.e., Convoy Operations). FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO						
Program #2 Robotic Vehicle Control Architecture (RVCA) Technology: This effort develops UGV end-to-end control architecture to reduce future technology integration risk and demonstrates the viability of autonomous operations in a relevant environment. In FY09, integrated an Advanced Brass Board (pre-prototype) Autonomous Navigation System (ANS) onto the UGV platform to test and measure system capabilities; conducted a soldier		4.400	4.719	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 27 of 90

1235 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 515: ROBOTIC GROUND SYSTEMS		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
operational experiment; finalized platform system development and updated with latest software interfaces. In FY10, finalize prototype Autonomous Navigation System and RVCA hardware/software designs and interfaces; complete all updates to the Autonomous Platform Demonstrator; perform engineering evaluations and Soldier operational exercises on the Autonomous Platform Demonstrator to test/measure system capabilities. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO						
Program #3 Small Business Innovative Research/Small Business Technology Transfer Programs. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base		0.000	0.282	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 28 of 90

1236 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive</i> <i>Advanced Technology</i>		PROJECT 515: <i>ROBOTIC GROUND SYSTEMS</i>	
<u>B. Accomplishments/Planned Program (\$ in Millions)</u>					
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011
<i>OCO FY 2011 Plans:</i> FY 2011 OCO					
Accomplishments/Planned Programs Subtotals		9.864	10.099	10.637	0.000
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A					
<u>D. Acquisition Strategy</u> N/A					
<u>E. Performance Metrics</u> 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.					

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				PROJECT			
2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)				PE 0603005A: Combat Vehicle and Automotive Advanced Technology				533: Ground Vehicle Demonstrations			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
533: Ground Vehicle Demonstrations	124.301	132.685	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
<u>A. Mission Description and Budget Item Justification</u> These are Congressional Interest Items											
<u>B. Accomplishments/Planned Program (\$ in Millions)</u>											
							FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1 Lightweight Structural Composite Armor for Blast and Ballistic Protection: In FY09, this Congressional Interest Item developed cost-effective structural armor utilizing 3D woven fiber composites with different materials in order to find the most balanced combination for ballistic resistance that reduces vehicle weight in order to enhance war fighter survivability and mobility. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO							1.595	0.000	0.000	0.000	0.000
Program #2							3.987	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 30 of 90

1238 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
3-D Advanced Battery Technology: In FY09, this Congressional Interest Item developed carbon foam poles in lead acid batteries for low weight and increase power density. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO						
Program #3 Antiballistic Windshield Armor (AWA): In FY09, this Congressional Interest Item focused on developing a pair of mirrored surfaces and opaque armor used in lieu of transparent armor in order to provide a full spectrum view of the environment in front of a tactical vehicle as well as enhanced ballistic protection. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base		3.589	2.387	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 31 of 90

1239 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
OCO FY 2011 Plans: FY 2011 OCO						
Program #4 Unmanned Ground Vehicle Initiative (UGVI): In FY09, this Congressional Interest Item developed, integrated, and demonstrated robotic capability in support of national security interests through integration and demonstration of sensor and control technologies to enable robotic systems to maneuver with minimal human intervention in militarily significant environment. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		11.959	10.943	0.000	0.000	0.000
Program #5 Vehicle Armor Structure Development & Testing for Future Combat Systems & JT Light Tactical Vehicle: In FY09, this Congressional Interest Item performed testing on materials for database development. In addition, various components were tested under various environmental conditions to increase design robustness. FY 2009 Accomplishments: FY 2009		0.797	1.592	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 32 of 90

1240 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #6 Crosshairs Hostile Fire Indicating System: In FY09, this Congressional Interest Item integrated the DARPA CROSSHAIRS Hostile Fire Indication System with the Iron Curtain Active Protection System (APS). FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		1.994	0.000	0.000	0.000	0.000
Program #7		2.552	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 33 of 90

1241 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010					
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)								
				FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Defect-Free Commercially Viable Si/C Semiconductor Using Superlattice Technology: In FY09, this Congressional Interest Item developed defect free superlattice substrate Si/C materials to be used in the development of Semiconductors. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO								
Program #8 Rotary Multi-Fuel Auxiliary Power Unit M1A1 Abrams Tank: In FY09, this Congressional Interest Item developed quiet, continuous, non-primary electrical power for extended engine-off operation and a system designed to fit into Abrams auxiliary power unit (APU) space claim. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010				2.392	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 34 of 90

1242 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010				
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)								
				FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Base FY 2011 Plans: FY 2011 Base								
OCO FY 2011 Plans: FY 2011 OCO								
Program #9 Tactical Rocket Propelled Grenade Airbag Protection System (TRAPS) Enhancement: In FY09, this Congressional Interest Item completed physics based model and simulation of TRAPS. Testing will be completed at EMRTC to verify and validate the model. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO				0.797	0.000	0.000	0.000	0.000
Program #10 Development of Logistical Fuel Processors to Meet Army/TARDEC/TACOM Needs. This is a Congressional Interest Item.				2.791	1.194	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 35 of 90

1243 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #11 Ground Forces Readiness Enabler for Advanced Tactical Vehicles (GREAT-V): This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.797	0.796	0.000	0.000	0.000
Program #12		1.994	2.387	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 36 of 90

1244 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Adv Lithium Iron Phosphate Battery Sys for Army Combat Hybrid HMMWV & Other Army Vehicle Platforms: In FY09, this Congressional Interest Item developed cells and battery packs for hybrid HMMWVs and developed lithium battery packs. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO						
Program #13 No-Idle Climate Control for Military Vehicles: In FY09, this Congressional Interest Item produced a modified commercial-off-the-shelf no idle climate control system. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base		1.595	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 37 of 90

1245 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
OCO FY 2011 Plans: FY 2011 OCO						
Program #14 Diminishing Manufacturing Sources and Material Shortages (DMSMS) Case Resolution Program: In FY09, this Congressional Interest Item provided a capability to coordinate with commercial industry on a broad scale. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		2.392	0.000	0.000	0.000	0.000
Program #15 Hybrid Electric (Heavy Truck) Vehicle: In FY09, this Congressional Interest Item developed engine propulsion systems for heavy tactical vehicles. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010		2.392	1.592	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 38 of 90

1246 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010				
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)								
				FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Base FY 2011 Plans: FY 2011 Base								
OCO FY 2011 Plans: FY 2011 OCO								
Program #16 Michigan Technological University's Project for Diverse Sensing for Synergistic Force Protection in Urban Threat Environments: In FY09, this Congressional Interest Item developed supporting technology for a sensor and processor for use by mobile ground force (vehicle and dismount) protection in dense urban environments against urban weapons threats. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO				0.797	1.592	0.000	0.000	0.000
Program #17 Ground Vehicle Integration Technologies: In FY09, this Congressional Interest Item leveraged commercial virtual-design technology pioneered in the automobile industry to develop a virtual-design environment capable of simulating military vehicles and modifications to these vehicles in a way that provides for rapid trade-off analyses.				2.392	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 39 of 90

1247 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #18 Advanced Hybrid Electric Vehicle Technologies for Fuel Efficient Blast Protected Vehicle: In FY09, this Congressional Interest Item utilized alternative fuels and improved energy efficiencies to improve vehicle mobility and protection.		1.197	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						

UNCLASSIFIED

R-1 Line Item #33

Page 40 of 90

1248 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #19 Fire Shield: In FY09, this Congressional Interest Item upgraded, updated and downsized Full Spectrum Active Protection Close-In Shield (FCLAS) technology, applied/integrated the improved FCLAS components into the close-in active protection concept, developed/demoed the "proof of concept" on vehicle platform and obtained Fire Shield (FS) component hardware for testing. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		3.189	3.183	0.000	0.000	0.000
Program #20 Power and Energy Research Equipment Upgrades: In FY09, this Congressional Interest Item expanded the in-house testing capability at TARDEC to evaluate high power components for future combat and wheeled vehicles. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010		5.980	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 41 of 90

1249 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #21 Advanced Performance Transparent Armor for Tactical Wheeled Vehicles: In FY09, this Congressional Interest Item developed transparent armor to allow for better protection at equivalent weights, or similar protection at reduced weights. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		1.197	0.000	0.000	0.000	0.000
Program #22 Model-Based Engineering Environment: In FY09, this Congressional Interest Item made 3D Computer-Aided Design (CAD) models a more integrated part of the Ground System Integration Domain's (GSID) Product Lifecycle Management (PLM) activities. Specific focus was in modernizing the "Tech Data Loop" utilized for spare part procurements to include 3D models and their associated attributes.		0.797	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 42 of 90

1250 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #23 Lithium Ion Battery Exchange Program: In FY09, this Congressional Interest Item provided for Abrams battery upgrade to 28 volt Li-ion for increase power for silent watch.		2.392	0.796	0.000	0.000	0.000
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #24		1.994	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 43 of 90

1251 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Medium Sized Unmanned Ground Vehicles Platform: In FY09, this Congressional Interest Item researched advanced sensor capabilities, communications and network technologies. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO						
Program #25 MRAP Supportability System (MSS): In FY09, this Congressional Interest Item improved and extended the Product Lifecycle Management (PLM) capabilities currently available. Specific focus was on connecting the product's technical data with the engineering, analysis, and logistics activities within the Ground System Integration Domain (GSID). FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010		3.987	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 44 of 90

1252 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #26 End-to-End Vehicle Survivability Technology: In FY09, this Congressional Interest Item utilized insight optimization framework to optimize and physically simulate blast mitigation components for a current fleet vehicle. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		1.595	0.000	0.000	0.000	0.000
Program #27 FCV Advanced Suspension System: In FY09, this Congressional Interest Item developed Magneto-Rheological (M-R) Compressible fluids for heavy combat vehicle suspensions.		1.595	2.149	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 45 of 90

1253 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #28 Hull Humvee Protection Program: In FY09, this Congressional Interest Item developed a proof-of-principle one piece, add-on, retro-fit V-shaped armor to be installed on the HMMWV for the purpose of demonstration and validation. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		1.994	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 46 of 90

1254 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #29 Implementation of an Advanced Tactical Wheeled Armored Vehicle System: In FY09, this Congressional Interest Item researched combining the best attributes of a conventional armored vehicle and a Mine Resistant Ambush Protected (MRAP) type vehicle. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		2.990	0.000	0.000	0.000	0.000
Program #30 Light Tactical Vehicle Ambulance Shelter: In FY09, this Congressional Interest Item developed a lightweight, composite, armor-ready shelter for a two door Medical Mission Module/HMMWV cargo variant, referred to as the ECV2, integrating the A-kit/B-kit design approach with the objective of significantly improving system survivability and mobility. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010		2.392	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 47 of 90

1255 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010				
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)								
				FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Base FY 2011 Plans: FY 2011 Base								
OCO FY 2011 Plans: FY 2011 OCO								
Program #31 Payload and Advanced Development for Next Generation Robot Platform: In FY09, this Congressional Interest Item developd and evaluated a manipulator arm and gripper sized to the 400 lb iRobot Warrior platform for both indoor and outdoor operations. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO				1.994	0.000	0.000	0.000	0.000
Program #32 Robotics Vehicle Secure Communications: In FY09, this Congressional Interest Item enhanced unmanned ground vehicle communications for Emergency-Stop, video, audio, vehicle control, with the use of secure wireless radio technology, which can ensure proper radio bandwidth and prioritize traffic from the vehicle enabling required features to function properly and in a timely manner.				1.994	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 48 of 90

1256 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #33 Advanced Corrosion Protection for Military Vehicles: In FY09, this Congressional Interest Item researched and demonstrated technologies to enhance Army corrosion prevention and control through development of new materials and application processes. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		2.392	2.387	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 49 of 90

1257 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #34 Combat Vehicle Electrical Power-21st Century (CVEP-21): In FY09, this Congressional Interest Item provided the Abrams with a potential solution to increase the electrical power output. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.797	0.000	0.000	0.000	0.000
Program #35 Applied Power Management Control and Integration: In FY09, this Congressional Interest Item developed an optimized non-primary system (NPS) solutions by hybridizing energy storage technology using peak shaving with small power generation devices for capability increases. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010		0.797	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 50 of 90

1258 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #36 Stryker Second Source Tire Research: In FY09, this Congressional Interest Item developed a second source for Stryker tires. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.797	0.000	0.000	0.000	0.000
Program #37 Magneto-Rheological (MR) Suspensions for Tactical Wheeled Vehicles: In FY09, this Congressional Interest Item developed magneto-rheological (M-R) dampers to handle the increasing payloads of armored vehicles. FY 2009 Accomplishments: FY 2009		2.392	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 51 of 90

1259 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #38 Ceramic and Metal Matrix Composite (MMC) Armor Development Using Ring Extruder Technology: In FY09, this Congressional Interest Item developed a range of alternatives which the government can consider for potential application of the 12-Screw Ring Extruder Continuous Mixing Manufacturing process to meet current and future military requirements. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.797	0.796	0.000	0.000	0.000
Program #39		3.987	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 52 of 90

1260 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Next Generation Diesel Engine for Ground Vehicles: In FY09, this Congressional Interest Item developed diesel engine technologies for increased power and efficiency. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO						
Program #40 Dynamometer Facility Upgrade Program at TARDEC: In FY09, this Congressional Interest Item provided upgrades to the dynamometer facility in preparation for the power and energy building. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base		3.189	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 53 of 90

1261 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010				
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)								
				FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
OCO FY 2011 Plans: FY 2011 OCO								
Program #41 Advanced Carbon Hybrid Battery for Hybrid Electric Vehicles. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO				0.000	0.796	0.000	0.000	0.000
Program #42 Advanced Technology for Energy Storage. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010				0.000	1.592	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 54 of 90

1262 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #43 Electric All Terrain Ultra Light Vehicle for the Minnesota National Guard. This is a Congressional Interest Item.		0.000	1.592	0.000	0.000	0.000
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #44 Fuel System Component Technology Research. This is a Congressional Interest Item.		0.000	1.592	0.000	0.000	0.000
FY 2009 Accomplishments: FY 2009						

UNCLASSIFIED

R-1 Line Item #33

Page 55 of 90

1263 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations			
B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO					
Program #45 Hybrid Electric Drive All Terrain Vehicle. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO	0.000	1.592	0.000	0.000	0.000
Program #46 Integrated Defense Technical Information. This is a Congressional Interest Item.	0.000	1.592	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 56 of 90

1264 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations			
B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009					
FY 2010 Plans: FY 2010					
Base FY 2011 Plans: FY 2011 Base					
OCO FY 2011 Plans: FY 2011 OCO					
Program #47 All Composite Lightweight Military Vehicle. This is a Congressional Interest Item.	0.000	1.592	0.000	0.000	0.000
FY 2009 Accomplishments: FY 2009					
FY 2010 Plans: FY 2010					
Base FY 2011 Plans: FY 2011 Base					
OCO FY 2011 Plans: FY 2011 OCO					
Program #48	0.000	1.592	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 57 of 90

1265 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
30-kW Auxiliary Power for Armored Combat Vehicles. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO						
Program #49 Compact 10 Kilowatt Generator Set for Army and Marine Combat Vehicles. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	1.592	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 58 of 90

1266 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #50 Future Tactical Truck Carbon Composite Shelter & Retrofit of Current Vehicle Shelters. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	1.592	0.000	0.000	0.000
Program #51 Military Installation Electric Vehicle Demonstration Project. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base		0.000	1.592	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 59 of 90

1267 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010				
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)								
				FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
OCO FY 2011 Plans: FY 2011 OCO								
Program #52 Networked Reliability and Safety Early Evaluation System (NRSEES). This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO				0.000	1.592	0.000	0.000	0.000
Program #53 All Composite Bus Program. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010				0.000	1.990	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 60 of 90

1268 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #54 Unmanned Robotic System Utilizing Hydrocarbon Fueled Solid Oxide Fuel Cell. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	2.387	0.000	0.000	0.000
Program #55 Friction Stir Welding Program. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009		0.000	2.387	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 61 of 90

1269 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations			
B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO					
Program #56 Advanced Lightweight Multi-Functional Multi-Threat Composite Armor Material Technology. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO	0.000	2.387	0.000	0.000	0.000
Program #57 On-board Vehicle Power Systems Development. This is a Congressional Interest Item.	0.000	2.467	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 62 of 90

1270 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations			
B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009					
FY 2010 Plans: FY 2010					
Base FY 2011 Plans: FY 2011 Base					
OCO FY 2011 Plans: FY 2011 OCO					
Program #58 Fully Burdened Cost of Fuel and Alternative Energy Methodology and Conceptual Model. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO	0.000	2.785	0.000	0.000	0.000
Program #59	0.000	2.866	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 63 of 90

1271 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Vehicle Maintenance and Prognostics System. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO						
Program #60 VSIL: Armored Vehicle Components and Systems Simulated in Cost-Effective Virtual Design and Test Environment. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	3.183	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 64 of 90

1272 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #61 Hybrid Engine Development Program for Tactical Wheeled Vehicle Fleet. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	3.183	0.000	0.000	0.000
Program #62 Zouline Armor. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	3.342	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 65 of 90

1273 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #63 Program Increase. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	3.730	0.000	0.000	0.000
Program #64 Advanced Battery Materials and Manufacturing. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	3.979	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 66 of 90

1274 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #65 Army Vehicle Condition Based Maintenance. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	3.979	0.000	0.000	0.000
Program #66 Plug-in Hybrid Electric Vehicle. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	3.979	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 67 of 90

1275 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #67 Simulation Based Reliability and Safety (SimBRS) Program. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	4.874	0.000	0.000	0.000
Program #68 Advanced Battery Development Program. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	8.953	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 68 of 90

1276 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #69 Alternative Energy Advanced Technology Development/Demonstration. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.000	18.155	0.000	0.000	0.000
Program #70 Advanced Composites Development for Light Weight, Low Cost Transportation Systems Using 3+ Extruder: In FY09, this Congressional Interest Item developed improved productivity through manufacturing process integration by using a "Powder to Parts" continuous manufacturing process. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base		2.392	2.387	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 69 of 90

1277 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
OCO FY 2011 Plans: FY 2011 OCO						
Program #71 Tactical Wheeled Vehicle Structures for Improved Survivability and Performance: In FY09, this Congressional Interest Item focused on advanced joint design, methods and technologies, advance monolithic and multi-material solutions, and enhanced structural response to blast/shock events. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		7.973	0.000	0.000	0.000	0.000
Program #72 Wireless Analysis and Visualization Engines for Sensors (WAVES): In FY09, this Congressional Interest Item evaluated a wide range of unmanned sensors that provides information back to the user. It prioritized the information that is critical to the user and presents it on display. FY 2009 Accomplishments: FY 2009		0.797	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 70 of 90

1278 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #73 Enhanced Military Vehicle Maintenance System Demo Project with Anniston Army Depot and Auburn Univ: In FY09, this Congressional Interest Item reduced infant mortality of rebuilt military vehicle components at Anniston Army Depot. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		1.595	2.785	0.000	0.000	0.000
Program #74		2.392	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 71 of 90

1279 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
N-STEP-Enabled Manufacturing Cell for Future Combat Systems: In FY09, this Congressional Interest Item leveraged the Standard for the Exchange of Product Model Data (STEP)/ISO manufacturing tools to improve productivity, efficiencies and quality. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO						
Program #75 C4ISR Auxiliary Power Unit (APU) for Soldier Tactical Applications: In FY09, this Congressional Interest Item developed non-primary power solutions for multiple military ground vehicle platforms during engine-off operations. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010		1.595	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 72 of 90

1280 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #76 Fire Resistant Fuels. This is a Congressional Interest Item.		3.189	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #77 Superlattice Semiconductors for Mobile SS Lighting and Solar Power Applications. This is a Congressional Interest Item.		2.392	2.785	0.000	0.000	0.000
FY 2009 Accomplishments: FY 2009						

UNCLASSIFIED

R-1 Line Item #33

Page 73 of 90

1281 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 533: Ground Vehicle Demonstrations			
B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2010 Plans: FY 2010					
Base FY 2011 Plans: FY 2011 Base					
OCO FY 2011 Plans: FY 2011 OCO					
Program #78 MATTRACKS. This is a Congressional Interest Item. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO	1.994	0.000	0.000	0.000	0.000
Program #79 High-Pressure Mobile Water Delivery System. This is a Congressional Interest Item.	0.798	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 74 of 90

1282 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 533: Ground Vehicle Demonstrations		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #80 Robotics Manipulators for Ordnance Disposal. This is a Congressional Interest Item.		0.748	0.000	0.000	0.000	0.000
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #81		3.189	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 75 of 90

1283 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive Advanced Technology</i>		PROJECT 533: <i>Ground Vehicle Demonstrations</i>		
<u>B. Accomplishments/Planned Program (\$ in Millions)</u>						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
<p>Joint Combat Support Trailer. In FY09, this Congressional Interest Item further developed and demonstrated advanced, high-performance aluminum structures and components and advanced designs for improved medium tactical trailers.</p> <p><i>FY 2009 Accomplishments:</i> FY 2009</p> <p><i>FY 2010 Plans:</i> FY 2010</p> <p><i>Base FY 2011 Plans:</i> FY 2011 Base</p> <p><i>OCO FY 2011 Plans:</i> FY 2011 OCO</p>						
Accomplishments/Planned Programs Subtotals		124.301	132.685	0.000	0.000	0.000
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A						
<u>D. Acquisition Strategy</u> N/A						
<u>E. Performance Metrics</u> 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.						

UNCLASSIFIED

R-1 Line Item #33

Page 76 of 90

1284 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>				R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive Advanced Technology</i>				PROJECT 53D: <i>NAC Demonstration Initiatives (CA)</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
53D: <i>NAC Demonstration Initiatives (CA)</i>	41.067	18.384	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
<u>A. Mission Description and Budget Item Justification</u> These are Congressional Interest Items <u>B. Accomplishments/Planned Program (\$ in Millions)</u>											
							FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1 Advanced Thermal Management System: In FY09, this Congressional Interest Item provided for the transition from demonstration to production for thermal and or oil management retrofit systems kits to market for both military vehicles. <i>FY 2009 Accomplishments:</i> FY 2009 <i>FY 2010 Plans:</i> FY 2010 <i>Base FY 2011 Plans:</i> FY 2011 Base <i>OCO FY 2011 Plans:</i> FY 2011 OCO							2.392	2.388	0.000	0.000	0.000
Program #2							0.797	2.785	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 77 of 90

1285 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 53D: NAC Demonstration Initiatives (CA)		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Hydraulic Hybrid Vehicles (HHV) for the Tactical Wheeled Fleet: In FY09, this Congressional Interest Item provided for the development of a series hydraulic hybrid drive train technology for military tactical vehicle applications. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO						
Program #3 Special Operations Vehicle - Lightweight, Armored, Hybrid, Power Generating,Tactical Vehicle: In FY09, this Congressional Interest Item developed, engineered and fabricated a Joint All terrain Modular Mobility Asset Vehicle. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010		1.994	0.795	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 78 of 90

1286 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 53D: NAC Demonstration Initiatives (CA)				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #4 Novel Onboard Hydrogen Storage System Development: In FY09, this Congressional Interest Item provided for the development and demonstration of an alkaline fuel cell system with increased durability and decreased weight using improved manufacturing technologies. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		0.798	0.000	0.000	0.000	0.000
Program #5 Base Security Systems: In FY09, this Congressional Interest Item developed base security systems for the Michigan National Guard (MING) bases across the state of Michigan.		1.197	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 79 of 90

1287 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 53D: NAC Demonstration Initiatives (CA)				
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #6 Alternative Energy Research: In FY09, this Congressional Interest Item provided for alternative energy research in three areas Advanced Energy Storage, Micro Grid and Alternative Fuels. Advanced Energy Storage demonstrated the first dual-use pilot cell manufacturing plant for advanced energy storage systems. Micro grid will build and demonstrate a micro grid with plug-in electric vehicles to determine the technical readiness of micro grids to accept power from various inputs while charging the selected vehicles and provide output power to various applications. Alternative Fuels advanced technology employing Fischer-Tropsch synthesis for production of military fuels from non-petroleum sources. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010		19.934	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 80 of 90

1288 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 53D: NAC Demonstration Initiatives (CA)		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #7 Next Generation Non-Tactical Vehicle Propulsion: In FY09, this Congressional Interest Item continued the development and demonstration of state of the art fuel cell Powertrain in light duty vehicles. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		1.595	0.000	0.000	0.000	0.000
Program #8 Advanced Drivetrains for Enhanced Mobility and Safety: In FY09, this Congressional Interest Item developed a front to rear transfer case to enable active torque management on a military tactical vehicle. FY 2009 Accomplishments: FY 2009		1.595	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 81 of 90

1289 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 53D: NAC Demonstration Initiatives (CA)			
B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2010 Plans: FY 2010					
Base FY 2011 Plans: FY 2011 Base					
OCO FY 2011 Plans: FY 2011 OCO					
Program #9 Advanced Digital Hydraulic Hybrid Drive System: In FY09, this Congressional Interest Item demonstrated a retrofit-able, multi-purpose series hybrid hydraulic system on a military tactical vehicle. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO	1.994	1.990	0.000	0.000	0.000
Program #10 Field Deployable Fleet Hydrogen Fueling. This is a Congressional Interest Item.	0.000	2.388	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 82 of 90

1290 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 53D: NAC Demonstration Initiatives (CA)		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #11 Defense Advanced Transportation Technology Program Hybrid Truck Users Forum. This is a Congressional Interest Item.		0.000	4.775	0.000	0.000	0.000
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #12		1.595	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 83 of 90

1291 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification			DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)	R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology	PROJECT 53D: NAC Demonstration Initiatives (CA)			
B. Accomplishments/Planned Program (\$ in Millions)					
	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Light Weight Medical Evacuation Unit: In FY09, this Congressional Interest Item designed, developed, built, tested, demonstrated and delivered a vehicle capable of providing uninterrupted, lifesaving medical treatment and evacuation. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO					
Program #13 Advanced Lightweight Multi-Functional Multi-Threat Composite Armor Technology: In FY09, this Congressional Interest Item will provide for the design of composite material to be multifunctional (provide protection and reduce heat signature) with self sensing technologies. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010	2.392	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 84 of 90

1292 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 3: Advanced Technology Development (ATD)		R-1 ITEM NOMENCLATURE PE 0603005A: Combat Vehicle and Automotive Advanced Technology		PROJECT 53D: NAC Demonstration Initiatives (CA)		
B. Accomplishments/Planned Program (\$ in Millions)						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Base FY 2011 Plans: FY 2011 Base						
OCO FY 2011 Plans: FY 2011 OCO						
Program #14 Lightweight Partial Hybrid Electric Military Transport Vehicle: In FY09, this Congressional Interest Item provided technical support for TARDEC's National Automotive Center hybrid vehicle platform. FY 2009 Accomplishments: FY 2009 FY 2010 Plans: FY 2010 Base FY 2011 Plans: FY 2011 Base OCO FY 2011 Plans: FY 2011 OCO		1.595	0.000	0.000	0.000	0.000
Program #15 Plug-in Hybrid Vehicle Electrification Program: In FY09, this Congressional Interest Item provided for the development, demonstration and validation of new technologies for grid to vehicle and vehicle to grid power flow and communications through the use of Plug In Hybrid Electric Vehicles and/or electric vehicles for military and commercial applications.		3.189	3.263	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 85 of 90

1293 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive Advanced Technology</i>		PROJECT 53D: <i>NAC Demonstration Initiatives (CA)</i>	
B. Accomplishments/Planned Program (\$ in Millions)					
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011
<i>FY 2009 Accomplishments:</i> FY 2009 <i>FY 2010 Plans:</i> FY 2010 <i>Base FY 2011 Plans:</i> FY 2011 Base <i>OCO FY 2011 Plans:</i> FY 2011 OCO					
Accomplishments/Planned Programs Subtotals		41.067	18.384	0.000	0.000
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.					

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>				R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive Advanced Technology</i>				PROJECT 53G: <i>FUTURE COMBAT SYSTEMS (FCS)</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
53G: <i>FUTURE COMBAT SYSTEMS (FCS)</i>	11.368	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
A. Mission Description and Budget Item Justification This project was focused on Science and Technology (S&T) efforts between the Army and Defense Advanced Research Projects Agency (DARPA) to develop technologies for Future Combat Systems (FCS). This project ends in FY09. Continuing efforts focused on Unmanned Ground Vehicles (UGVs) transitioned to Project 515. 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.											
B. Accomplishments/Planned Program (\$ in Millions)											
							FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1 In FY09, finalized control architecture designs for the control of UGVs by Soldier operators; finalized designs and finished development of the mission execution, computer operating environment, vehicle management, sensor management and fusion hardware and software for UGV control and integrated components onto the vehicle platform in preparation for engineering evaluations. Related work is also being conducted in the Robotic Vehicle Control Architecture Technology effort in project 515. <i>FY 2009 Accomplishments:</i> FY 2009 <i>FY 2010 Plans:</i> FY 2010 <i>Base FY 2011 Plans:</i> FY 2011 Base							11.368	0.000	0.000	0.000	0.000

UNCLASSIFIED

R-1 Line Item #33

Page 87 of 90

1295 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>	R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive Advanced Technology</i>	PROJECT 53G: <i>FUTURE COMBAT SYSTEMS (FCS)</i>			
<u>B. Accomplishments/Planned Program (\$ in Millions)</u>					
	FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
<i>OCO FY 2011 Plans:</i> FY 2011 OCO					
Accomplishments/Planned Programs Subtotals	11.368	0.000	0.000	0.000	0.000
<u>C. Other Program Funding Summary (\$ in Millions)</u>					
N/A					
<u>D. Acquisition Strategy</u>					
N/A					
<u>E. Performance Metrics</u>					
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.					

UNCLASSIFIED

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE				PROJECT			
2040: Research, Development, Test & Evaluation, Army				PE 0603005A: Combat Vehicle and Automotive				C66: DC66			
BA 3: Advanced Technology Development (ATD)				Advanced Technology							
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	Base FY 2011 Estimate	OCO FY 2011 Estimate	Total FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
C66: DC66	0.654	2.431	4.304	0.000	4.304	4.278	3.450	3.158	3.399	Continuing	Continuing
A. Mission Description and Budget Item Justification											
The purpose of this project is to conduct resesarch on classified efforts. The details of these efforts may be provided to appropriately cleared individuals upon request.											
B. Accomplishments/Planned Program (\$ in Millions)											
							FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
Program #1							0.654	2.363	4.304	0.000	4.304
Classified efforts											
FY 2009 Accomplishments:											
FY 2009											
FY 2010 Plans:											
FY 2010											
Base FY 2011 Plans:											
FY 2011 Base											
OCO FY 2011 Plans:											
FY 2011 OCO											
Program #2							0.000	0.068	0.000	0.000	0.000
Small Business Innovative Research/Small Business Technology Trasnfer Programs											

UNCLASSIFIED

R-1 Line Item #33

Page 89 of 90

1297 of 1536

UNCLASSIFIED

Exhibit R-2A, PB 2011 Army RDT&E Project Justification				DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 3: <i>Advanced Technology Development (ATD)</i>		R-1 ITEM NOMENCLATURE PE 0603005A: <i>Combat Vehicle and Automotive Advanced Technology</i>		PROJECT C66: <i>DC66</i>		
<u>B. Accomplishments/Planned Program (\$ in Millions)</u>						
		FY 2009	FY 2010	Base FY 2011	OCO FY 2011	Total FY 2011
<i>FY 2009 Accomplishments:</i> FY 2009 <i>FY 2010 Plans:</i> FY 2010 <i>Base FY 2011 Plans:</i> FY 2011 Base <i>OCO FY 2011 Plans:</i> FY 2011 OCO						
Accomplishments/Planned Programs Subtotals		0.654	2.431	4.304	0.000	4.304
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A						
<u>D. Acquisition Strategy</u> N/A						
<u>E. Performance Metrics</u> 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.						

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