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

APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE							
2040: <i>Research, Development, Test & Evaluation, Army</i> BA 5: <i>Development & Demonstration (SDD)</i>				PE 0604854A: <i>Artillery Systems - EMD</i>							
COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
Total Program Element	152.935	53.624	120.146	-	120.146	82.995	25.229	24.810	5.283	Continuing	Continuing
509: <i>LIGHTWEIGHT 155M HOWITZER</i>	5.423	-	-	-	-	-	-	-	-	0.000	5.423
516: <i>PALADIN/FAASV</i>	147.512	53.624	120.146	-	120.146	82.995	25.229	24.810	5.283	Continuing	Continuing

Note

Change Summary Explanation: Funding - FY 2011: Funding increase to support the Paladin/FAASV program.

A. Mission Description and Budget Item Justification

This program element supports the Joint Light Weight 155mm Howitzer (LW155) and the Paladin/FAASV Improvement programs. Beginning in FY11, only the Paladin/FAASV Improvement program has RDTE funding in this program element.

The Paladin/Field Artillery Ammunition Support Vehicle (FAASV) Integrated Management (PIM) process will provide for the procurement of the approved obsolescence and sustainment modifications to the 155MM Self-Propelled Howitzer and FAASV, increase reliability and maneuverability as well as reduce life cycle costs. These will include leveraging Bradley common components, integrating the engine, transmission, final drives, and suspension. It will also replace obsolete components such as the Dynamic Reference Unit-Hybrid (DRU-H), hydraulics, fatigued hull structures as well as focus on powertrain, power management and electronic sub-systems.

B. Program Change Summary (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	115.811	53.624	5.362	-	5.362
Current President's Budget	152.935	53.624	120.146	-	120.146
Total Adjustments	37.124	-	114.784	-	114.784
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	0.777	-			
• Other Adjustments 1	36.347	-	114.784	-	114.784

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Army									DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 5: Development & Demonstration (SDD)				R-1 ITEM NOMENCLATURE PE 0604854A: Artillery Systems - EMD				PROJECT 509: LIGHTWEIGHT 155M HOWITZER			
COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
509: LIGHTWEIGHT 155M HOWITZER	5.423	-	-	-	-	-	-	-	-	0.000	5.423
Quantity of RDT&E Articles											
A. Mission Description and Budget Item Justification											
The Lightweight 155mm (LW155) Towed Howitzer, a jointly managed program with the Marine Corps, replaces the M198, 155mm Towed Howitzer. LW155 provides significant strategic and tactical mobility improvements. Project 509 supports Towed Artillery Digitization (TAD) Block II, an upgrade to the digital fire control system for the M777A2 (LW155).											
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Matrix Support Articles: Description: Funds Matrix Support Software Engineers with ARDEC for TAD Block II Software Development FY 2010 Accomplishments: Funds Matrix Support Software Engineers with ARDEC for TAD Block II Software Development							5.260	-	-	-	-
							0				
Title: Small Business Articles: Description: Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR) FY 2010 Accomplishments: Small Business Innovative Research/Small Business Technology Transfer Programs (SBIR/STTR)							0.163	-	-	-	-
							0				
Accomplishments/Planned Programs Subtotals							5.423	-	-	-	-
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• Towed Howitzer with TAD Prod, BLIN: Procurement, Marine Corps LW155 Towed Howitzer with TAD Prod, BLIN 218500	1,169.203	113.956	5.552	16.000	21.552		6.054	6.271	6.497	0.000	1,329.078

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APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 5: Development & Demonstration (SDD)				R-1 ITEM NOMENCLATURE PE 0604854A: Artillery Systems - EMD				PROJECT 509: LIGHTWEIGHT 155M HOWITZER			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• Army, LW155 with TAD G01700: Procurement, WTCV, Army, LW155 with TAD G01700	157.415	62.000	13.066		13.066					0.000	246.131
D. Acquisition Strategy											
Towed Artillery Digitization (TAD) is an evolutionary acquisition strategy for the Lightweight 155mm Towed Howitzer (LW155). Block 0 consisted of "glass and iron" optical sights as the weapon's fire control. Block 1 TAD incorporated digitized aiming and pointing which increased accuracy and enabled a battery of howitzers to emplace and engage the enemy within 2 to 3 minutes as opposed to 15 to 20 minutes. Block 1a added the ability for the LW155 Howitzer to fire the XM982 Excalibur Precision Munition. Funding identified above will be used to upgrade to Block 2, which is the objective TAD configuration. The primary benefit of TAD Block 2 will be the addition of mission processing capability at the platform, enabling enhanced responsiveness and flexibility to the battlefield commander. It will also integrate a Muzzle Velocimeter for increased accuracy.											
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.											

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APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 5: Development & Demonstration (SDD)				R-1 ITEM NOMENCLATURE PE 0604854A: Artillery Systems - EMD				PROJECT 516: PALADIN/FAASV			
COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
516: PALADIN/FAASV	147.512	53.624	120.146	-	120.146	82.995	25.229	24.810	5.283	Continuing	Continuing
Quantity of RDT&E Articles											
A. Mission Description and Budget Item Justification											
The Paladin/Field Artillery Ammunition Support Vehicle (FAASV) Integrated Management (PIM) process will provide for the procurement of the approved obsolescence and sustainment modifications to the 155MM Self-Propelled Howitzer and FAASV, increase reliability and maneuverability as well as reduce life cycle costs. These will include leveraging Bradley common components, integrating the engine, transmission, final drives, and suspension. It will also replace obsolete components such as the Dynamic Reference Unit-Hybrid (DRU-H), hydraulics, fatigued hull structures as well as focus on powertrain, power management and electronic sub-systems.											
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Title: Paladin Integrated Management (PIM) Development							126.150	30.223	96.146	-	96.146
Articles:							0	0			
Description: Funding is provided for the following effort											
FY 2010 Accomplishments:											
Paladin Integrated Management (PIM) Development for integration of common components into prototype vehicles for testing to increase the reliability and maneuverability as well as reduce life cycle costs.											
FY 2011 Plans:											
Paladin Integrated Management (PIM) Development for integration of common components into prototype vehicles for testing to increase the reliability and maneuverability as well as reduce life cycle costs.											
FY 2012 Base Plans:											
Paladin Integrated Management (PIM) Development for integration of common components into prototype vehicles for testing to increase the reliability and maneuverability as well as reduce life cycle costs.											
Title: Test and Evaluation							6.918	11.674	13.000	-	13.000
Articles:							0	0			
Description: Funding is provided for the following effort											
FY 2010 Accomplishments:											
Test and Evaluation to include contractor testing and live-fire testing.											
FY 2011 Plans:											

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Army									DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 5: Development & Demonstration (SDD)				R-1 ITEM NOMENCLATURE PE 0604854A: Artillery Systems - EMD				PROJECT 516: PALADIN/FAASV			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)							FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Test and Evaluation to include contractor testing, government development test, and live-fire testing.											
FY 2012 Base Plans: Test and Evaluation to include government development test and live-fire testing.											
Title: Program management							14.444	11.727	11.000	-	11.000
Articles:							0	0			
Description: Program management											
FY 2010 Accomplishments: Program management											
FY 2011 Plans: Program management											
FY 2012 Base Plans: Program management											
Accomplishments/Planned Programs Subtotals							147.512	53.624	120.146	-	120.146
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
• GA0400: Paladin/FAASV	42.608	105.277	46.876		46.876		222.814	247.202	291.164	3,566.716	4,696.023
D. Acquisition Strategy											
The PIM process is part of the overall Heavy Brigade Combat Team (HBCT) fleet management strategy for the Paladin/Field Artillery Ammunition Support Vehicle (FAASV) to address ongoing obsolescence issues and ensure long term sustainment of these systems. The PIM process leverages both Government and Contractor capabilities in developing a system's level approach to address the obsolescence issues through the integration of proven Bradley common components (power train, suspension and electronics) and Future Combat Systems(FCS) Non-Line of Sight Cannon (NLOS-C) electrical systems technologies into a new chassis. To obtain the best value for the Army, PM Self-Propelled Howitzer System is using the Original Equipment Manufacturer (OEM) as the system integrator for developing and producing these Paladin/FAASV Integrated Management (PIM) vehicles. The PIM process development/integration effort began in FY07 utilizing a System Technical Support (STS) work directive that covered System Functional Review (SFR), Preliminary Design Review (PDR) and Critical Design Review (CDR) system engineering activities and early procurement of key components to support the building of 5 Howitzers/2 FAASVs that will undergo Government Testing in FY11-13. In FY09, the PM Self-Propelled Howitzer System awarded a cost reimbursable R&D contract for the completion of PIM process development efforts and the fabrication, assembly											

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APPROPRIATION/BUDGET ACTIVITY
2040: *Research, Development, Test & Evaluation, Army*
BA 5: *Development & Demonstration (SDD)*

PROJECT
516: *PALADIN/FAASV*

and delivery of 7 prototypes (5 Howitzers/2 FAASVs) for Government testing (Development Testing, Limited User Test, and Live Fire). Following a successful MS C decision, PM Self-Propelled Howitzer System will award a contract for the fabrication and delivery of 18 PIM sets (18 Paladins and 18 FAASV's) as part of Low Rate Initial Production (LRIP) of which 5 sets will be used for Initial Operational Test (IOT) testing.

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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Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Army										DATE: February 2011			
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 5: Development & Demonstration (SDD)				R-1 ITEM NOMENCLATURE PE 0604854A: Artillery Systems - EMD				PROJECT 516: PALADIN/FAASV					
Management Services (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO Support	SS/FP	PM Paladin/FAASV:Picatinny, NJ/TACOM	15.996	11.727		11.000		-		11.000	Continuing	Continuing	Continuing
Subtotal			15.996	11.727		11.000		-		11.000			
Product Development (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Component Design and Software Development	SS/FP	Northrop Grumman:Carson, CA	5.027	-		-		-		-	Continuing	Continuing	Continuing
System Integration	SS/FP	BAE Systems:York, PA	4.834	-		-		-		-	Continuing	Continuing	Continuing
Technical Data Package (TDP) Development	SS/FP	Other Gov't Agencies:Various	0.452	-		-		-		-	Continuing	Continuing	Continuing
Software Development & System Integration	SS/FP	TACOM-ARDEC:Picatinny, NJ	10.990	-		-		-		-	Continuing	Continuing	Continuing
PIM Development	SS/FP	BAE Systems:York, PA	102.634	30.223		96.146		-		96.146	Continuing	Continuing	Continuing
Initiate PIM IPT Structure	SS/FP	BAE/Northrup Grumman:Various	1.688	-		-		-		-	Continuing	Continuing	Continuing
Small Business Innovative Research/Small Business Technology Transfer Program	Various	TACOM:Warren, MI	-	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			125.625	30.223		96.146		-		96.146			
Support (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
TARDEC	TBD	TBD:TBD	0.367	-		-		-		-	Continuing	Continuing	Continuing
Logistics	Various	TACOM-ACALA,:various	0.229	-		-		-		-	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Army											DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 5: <i>Development & Demonstration (SDD)</i>				R-1 ITEM NOMENCLATURE PE 0604854A: <i>Artillery Systems - EMD</i>				PROJECT 516: <i>PALADIN/FAASV</i>					

Support (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			0.596	-		-		-		-			

Test and Evaluation (\$ in Millions)				FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Component Level Testing	SS/FP	TACOM-ARDEC:Picatinny, NJ	0.953	-		-		-		-	Continuing	Continuing	Continuing
System Level Testing	Various	Various OGAs:Various	20.574	11.674		13.000		-		13.000	Continuing	Continuing	Continuing
Subtotal			21.527	11.674		13.000		-		13.000			

			Total Prior Years Cost	FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			163.744	53.624		120.146		-		120.146			

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2012 Army			DATE: February 2011		
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 5: <i>Development & Demonstration (SDD)</i>		R-1 ITEM NOMENCLATURE PE 0604854A: <i>Artillery Systems - EMD</i>		PROJECT 516: <i>PALADIN/FAASV</i>	

	FY 2010				FY 2011				FY 2012				FY 2013				FY 2014				FY 2015				FY 2016			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Contractor Testing																												
Government Development Test																												
Milestone C																												
Full Up System Live Fire Test																												
IOTE																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2012 Army			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 2040: <i>Research, Development, Test & Evaluation, Army</i> BA 5: <i>Development & Demonstration (SDD)</i>	R-1 ITEM NOMENCLATURE PE 0604854A: <i>Artillery Systems - EMD</i>	PROJECT 516: <i>PALADIN/FAASV</i>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Contractor Testing	1	2010	4	2010
Government Development Test	2	2011	1	2013
Milestone C	2	2013	2	2013
Full Up System Live Fire Test	3	2015	3	2016
IOTE	2	2016	3	2016