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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	8.349	22.994	31.120	-	31.120	23.067	17.846	13.136	21.181	Continuing	Continuing
ET8: <i>Personnel Airdrop System Development</i>	-	0.000	0.000	0.690	-	0.690	0.500	0.400	0.300	0.000	0.000	1.890
S51: <i>Aircrew Integrated Sys Ad</i>	-	0.161	0.152	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.313
S53: <i>Clothing And Equipment</i>	-	1.555	9.985	3.582	-	3.582	3.571	1.845	2.495	3.113	Continuing	Continuing
S54: <i>Small Arms Improvement</i>	-	4.004	7.449	10.554	-	10.554	7.285	7.377	7.472	15.421	Continuing	Continuing
VS4: <i>Soldier Protective Equipment</i>	-	2.629	5.408	16.294	-	16.294	11.711	8.224	2.869	2.647	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) for Advanced Component Development and Prototypes manages the Soldier as a system in order to increase combat effectiveness, test and deliver tangible products that save Soldier's lives, and improve Soldier's quality of life. It evaluates, develops, and tests emerging technologies and critical Soldier support systems to reduce technology risk.

Project ET8 funding (Personnel Airdrop System) supports efforts to improve Static Line (SL) and Military Free Fall (MFF) personnel parachutes and associated equipment to include canopy improvements based on integration of new technology with the goal of enhancing the insertion capability of the airborne soldier and increasing the performance, safety and durability of personnel airdrop equipment.

Project S51 funding (Aircrew Integrated Systems) supports component development and prototyping of critical Soldier support systems and other combat service support equipment that will improve unit sustainability and combat effectiveness.

Project S53 funding (Clothing and Equipment) supports development of state-of-the-art technology to improve tactical and non-tactical clothing and individual equipment to enhance the lethality, survivability, and mobility of the individual Soldier.

Project S54 funding (Small Arms Improvement) provides funds to develop, demonstrate and evaluate emerging technology for integration of systems, subcomponents and prototypes designed to enhance lethality, target acquisition, fire control, training effectiveness and reliability for current and future small arms weapon systems and ammunition.

Project VS4 funding (Soldier Protective Equipment) supports efforts to evaluate integrated technologies and representative or prototype systems that help expedite Individual Soldier Ballistic Protection technology transition from the laboratory to operational use.

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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>
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B. Program Change Summary (\$ in Millions)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Previous President's Budget	5.983	22.194	22.910	-	22.910
Current President's Budget	8.349	22.994	31.120	-	31.120
Total Adjustments	2.366	0.800	8.210	-	8.210
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	2.366	0.800	8.210	-	8.210

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Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) ET8 / <i>Personnel Airdrop System Development</i>			
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
ET8: <i>Personnel Airdrop System Development</i>	-	0.000	0.000	0.690	-	0.690	0.500	0.400	0.300	0.000	0.000	1.890
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding line established in FY17 for the Personnel Airdrop System Development. Efforts were previously executed in Program Element 0603827A S53.

A. Mission Description and Budget Item Justification

This funding supports efforts to improve Static Line (SL) and Military Free Fall (MFF) personnel parachutes and associated equipment to include canopy improvements based on integration of new technology with the goal of enhancing the insertion capability of the airborne soldier and increasing the performance, safety and durability of personnel airdrop equipment. Includes integration and interface on the Soldier system.

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

	FY 2015	FY 2016	FY 2017
Title: Personnel Airdrop System Development	-	-	0.690
Description: Funding line is newly established in FY17. Efforts were previously executed in Program Element 0603827A S53.			
FY 2017 Plans: Continue to evaluate component and subsystem technologies across the airdrop portfolio to meet objective requirements for static line and military free fall parachutists and transition to ES9 to prove out capability insertions through Developmental Testing (DT) and Operational Testing (OT). Perform a market survey, system integration and initial evaluation of the performing modeling and analysis of parachute deployment to improve canopy performance. Obtain Material Development Decision (MDD) in 2QFY17 to conduct market research and preliminary evaluation of an improved Parachutists Oxygen Delivery System to provide increased capacity for oxygen to support longer duration Military Free Fall operations.			
Accomplishments/Planned Programs Subtotals	-	-	0.690

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

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• RDTE 654601 ES9: <i>RDTE 0604601A ES9 Advanced Tactical Parachute System</i>	-	-	1.487	-	1.487	5.709	10.020	3.528	1.851	0.000	22.595

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army	Date: February 2016
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) ET8 / <i>Personnel Airdrop System Development</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OPA MA7801: <i>OPA MA7801 Advanced Tactical Parachute System</i>	25.996	26.088	16.611	-	16.611	18.860	24.610	26.890	22.040	0	161.095

Remarks

D. Acquisition Strategy

Programs pursue technology maturation and prototype development, culminating in the transition of mature technologies (TRL 6-7) to Engineering and Manufacturing Development.

E. Performance Metrics

N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) ET8 / <i>Personnel Airdrop System Development</i>
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
Evaluate component and subsystem technologies																												
(1) Parachutists Oxygen Delivery System (PODS) MDD													▲ 1															
PODS Market Research																												
(2) PODS MS B																	▲ 2											

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) ET8 / <i>Personnel Airdrop System Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Evaluate component and subsystem technologies	1	2017	4	2020
Parachutists Oxygen Delivery System (PODS) MDD	2	2017	2	2017
PODS Market Research	2	2017	1	2018
PODS MS B	2	2018	2	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S51 / <i>Aircrew Integrated Sys Ad</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
S51: <i>Aircrew Integrated Sys Ad</i>	-	0.161	0.152	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.313
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding for this Project of S51 ends with FY2016.

A. Mission Description and Budget Item Justification

This project supports the Advanced Component Development and Prototyping of select Air Soldier System (Air SS) technologies. The Air SS provides improved safety, survivability, and human performance that amplifies the Warfighter's effectiveness and facilitates full-spectrum dominance of Army aircraft. The Air SS addresses capability gaps identified during combat operations in Iraq and Afghanistan including the effects of weight and bulk, limited situational awareness, and lack of functionally integrated aircrew member life support equipment. The Air SS follows an evolutionary acquisition approach that integrates mature technologies to build to the full capability. Air SS reduces overall weight and bulk of aircrew equipment, increases situational awareness, and enhances aircrew mobility. This funding provides advanced development for the Air SS in technology areas supporting improved laser eye protection, integrated power, wireless personal area networks, lightweight protective clothing, and tactile situational awareness cueing. Includes integration and interface of products on Soldiers.

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

	FY 2015	FY 2016	FY 2017
Title: Aircrew Integrated Systems (ACIS) Advanced Development	0.161	0.152	-
Description: Advanced Component Development and Prototyping (ACDP) of critical aircrew support systems technology improvements and Advanced Development (AD) and risk reduction efforts required for transition for insertion into Air Soldier System Program of Record.			
FY 2015 Accomplishments: Fund laboratories to monitor and influence Air SS technologies to include advanced wide field of view/high resolution helmet mounted display technologies and miniaturized communication devices for transition into Air SS preplanned product improvements phase.			
FY 2016 Plans: Continue to resource laboratories to monitor and influence Air SS technologies to include advanced wireless battery charging and wireless personal area networks for transition into Air SS preplanned product improvements phase.			
Accomplishments/Planned Programs Subtotals	0.161	0.152	-

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S51 / <i>Aircrew Integrated Sys Ad</i>

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

Line Item	FY 2015	FY 2016	FY 2017	FY 2017	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	Cost To	
			Base	OCO	Total					Complete	Total Cost
• ACIS Engineering Development: <i>RDTE, A PE 0604601A PROJ S61-SDD</i>	1.742	3.463	3.811	-	3.811	3.849	3.840	1.897	1.749	Continuing	Continuing
• Aircrew Integrated Systems: <i>Aircraft Procurement, Army SSN AZ3110 - ACIS</i>	48.081	44.085	30.297	-	30.297	47.066	30.896	32.684	30.457	Continuing	Continuing

Remarks

D. Acquisition Strategy

Air SS employs an incremental acquisition approach to improve the mission effectiveness, survivability, Situational Awareness, and safety of Army aircrews. These funds resource various government agencies and labs in the transition of emerging technologies to the Air SS program.

E. Performance Metrics

N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S51 / <i>Aircrew Integrated Sys Ad</i>
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
Air Soldier System Advanced Development	Air Soldier System Advanced Dev																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S51 / <i>Aircrew Integrated Sys Ad</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Air Soldier System Advanced Development	1	2015	4	2016

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army										Date: February 2016		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) S53 / <i>Clothing And Equipment</i>			
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
S53: <i>Clothing And Equipment</i>	-	1.555	9.985	3.582	-	3.582	3.571	1.845	2.495	3.113	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding supports efforts to evaluate and integrate technologies and representative or prototype systems that help expedite Soldier uniform and clothing technology transition from the laboratory to operational use. Efforts focus on proving out commonality across as broad a spectrum of users as possible to provide a modular, integrated uniform/clothing system from skin out and head-to-toe. It funds efforts to investigate new technologies and domestically available fabrics with Flame Resistance, moisture wicking, insect protection and camouflage technologies, including evaluation and integration of fabrics appropriate for uniforms and equipment used in jungle/tropical and Arctic environments. It funds efforts to improve personnel parachutes, to include analysis of canopy cloth fabrics and pack volume techniques. New technologies are investigated to monitor health and improve Soldier survivability, reduce weight, and improve affordability, mobility and comfort in combat and training/administrative environments. Includes integration and interface on the Soldier system.

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

	FY 2015	FY 2016	FY 2017
Title: Soldier Uniforms and Clothing	0.890	6.691	2.768
Description: Develop and provide superior and sustainable integrated clothing for the Soldier in a rapidly changing global environment.			
FY 2015 Accomplishments: Tactical/Personal Clothing. Continued to develop more durable FR fabrics for use in combat uniforms to improve service life of tactical uniforms. Conducted burn tests of insulated FR Fabrics for use in environmental clothing systems. Continued evaluation to effectively provide permethrin treatment to tactical uniforms. Continued evaluation at fabric levels to improve IR management.			
FY 2016 Plans: Tactical Clothing. Conduct evaluation of new technologies to mitigate spectral reflectance of combat uniforms. Evaluate current products to establish performance metrics for incorporation in future specifications. Develop accurate digital objective color assessment technology to provide pass/fail shade assessments for quality control. Evaluate improved lighter weight textiles which incorporate improved vector protection, FR protection, and environmental protection while providing comfort, utility, and functionality. Will continue to develop alternate insect protection with lower toxicity for all combat uniform fabrics (i.e. Army Combat Shirt, Army Combat Pants, FR Army Combat Uniform). Continue to develop more durable FR fabrics for use in combat uniforms to improve service life of tactical uniforms.			
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S53 / <i>Clothing And Equipment</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2015	FY 2016	FY 2017
<p>Tactical Clothing. Obtain Material Development Decision (MDD) and initiate technical testing on Environmental Protection System (EPS) component prototypes to provide Soldiers protection in all extreme environmental conditions. Conduct evaluation and integration of fabrics appropriate for uniforms and equipment used in jungle/tropical and Arctic environments. Initiate testing of Military Free Fall (MFF) Parachutist Environmental Equipment to provide protection for MFF parachutists while conducting High Altitude, High Opening (HAHO) MFF operations (lower temperatures, higher altitudes) for longer duration of time. Transition to S60 with MS B in 1QFY18. Continue to evaluate at the technical levels means to improve protection against cold weather, insects, and flame while increasing moisture management, signature management, breathability, and durability for tactical clothing. Initiate effort to improve the durability and reduce the fabric weight and cost of the sniper Flame Resistant Ghillie Suit. Initiate effort to improve fit, durability, and comfort of the Flame Resistant Fuel Handler Coveralls.</p>				
<p>Title: Individual Equipment</p> <p>Description: Develop and provide superior and sustainable integrated individual equipment for the Soldier in a rapidly changing global environment.</p> <p>FY 2015 Accomplishments: Hydration: Following Material Development Decision in 1QFY15, procured test assets and verified water purification test methodology to support Individual Water Treatment Device (IWTD) program of record.</p> <p>FY 2016 Plans: Load Carriage. Obtain Milestone B Decision for Individual Water Treatment Device (IWTD) in 4QFY16 and transition effort to S60. Conduct Front End Analysis on Integrated Load Carriage System (ILCS) in 3FY16 to inform technology integration requirements to ensure ILCS fully integrates with Soldier Protection System (SPS). Airdrop. Evaluate potential material solutions at the component level to enhance the T-11 and T-11R parachute systems to include potential pack tray redesign, packing loop configurations, and potential improvements to the slider, deployment sleeve and bridle. Determine technology readiness level and feasibility of integration an automatic opening device on static line parachute systems.</p> <p>FY 2017 Plans: Integrated Load Carriage. Obtain Material Development Decision (MDD) and initiate technical testing on the Integrated Load Carriage System (ILCS). The ILCS will provide an integrated load carriage that interfaces with the Soldier Protection System (SPS). Transition to S60 with MS B in 2QFY18.</p>		0.665	3.294	0.814
Accomplishments/Planned Programs Subtotals		1.555	9.985	3.582

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S53 / <i>Clothing And Equipment</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0604601A S60: <i>RDTE, 0604601A.S60, Clothing and Equipment</i>	2.422	5.980	10.166	-	10.166	7.814	5.593	7.813	9.414	Continuing	Continuing
• 121017 CFF OMA: <i>OMA, 121017, Central Funding and Fielding</i>	126.972	56.088	37.748	-	37.748	37.719	37.709	37.550	57.119	Continuing	Continuing
• MA7801 OPA: <i>OPA, MA7801, Advanced Tactical Parachute System</i>	25.996	26.088	16.611	-	16.611	18.860	24.610	26.890	22.040	Continuing	Continuing

Remarks

D. Acquisition Strategy

Programs pursue technology maturation and prototype development, culminating in the transition of mature technologies (TRL 6-7) to Engineering and Manufacturing Development. This project continues to exercise competitively awarded contracts using best value source selection procedures.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 4				PE 0603827A / Soldier Systems - Advanced Development				S53 I Clothing And Equipment								
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
In-House Support	TBD	PM SPIE : Ft. Belvoir, VA	14.288	-		0.800		0.200		-		0.200	Continuing	Continuing	Continuing	
Subtotal			14.288	-		0.800		0.200		-		0.200	-	-	-	
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Engineering Support	MIPR	NSRDEC : Natick, MA	14.383	0.200		0.845		0.500		-		0.500	Continuing	Continuing	Continuing	
Development Contracts	C/FFP	Various : Various	28.190	1.100		3.740		0.695		-		0.695	Continuing	Continuing	Continuing	
Subtotal			42.573	1.300		4.585		1.195		-		1.195	-	-	-	
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Misc Support Costs	MIPR	Various : Various	7.077	-		0.700		0.300		-		0.300	Continuing	Continuing	Continuing	
Subtotal			7.077	-		0.700		0.300		-		0.300	-	-	-	
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Testing Costs	MIPR	various : Various	20.322	0.255		3.900		1.887		-		1.887	Continuing	Continuing	Continuing	
Subtotal			20.322	0.255		3.900		1.887		-		1.887	-	-	-	
Project Cost Totals			84.260	1.555		9.985		3.582		-		3.582	-	-	-	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army							Date: February 2016			
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	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract	

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S53 / <i>Clothing And Equipment</i>
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
UNIFORM CLOTHING																												
Permethrin Testing																												
Flame Resistant Clothing Upgrades																												
Improve Signature Mgmt (IR) Eval & Camo in Clothing & Equipment																												
(1) Environmental Protection System MDD																												
(2) Environmental Protection System MS B																												
INDIVIDUAL EQUIPMENT																												
(3) Integrated Load Carriage System MDD																												
(4) Integrated Load Carriage System MS B																												
IWTD P248 Standard Testing																												
(5) IWTD MS B																												
T-11 Ruggedized Packing Testing																												
T-11R Pack Tray Design Testing																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
UNIFORM CLOTHING	1	2008	4	2018
Permethrin Testing	1	2011	4	2018
Flame Resistant Clothing Upgrades	1	2009	4	2018
Improve Signature Mgmt (IR) Eval & Camo in Clothing & Equipment	2	2012	4	2018
Environmental Protection System MDD	1	2017	1	2017
Environmental Protection System MS B	1	2018	1	2018
INDIVIDUAL EQUIPMENT	1	2009	4	2018
Integrated Load Carriage System MDD	2	2017	2	2017
Integrated Load Carriage System MS B	2	2018	2	2018
IWTD P248 Standard Testing	1	2015	1	2016
IWTD MS B	4	2016	4	2016
T-11 Ruggedized Packing Testing	2	2016	4	2016
T-11R Pack Tray Design Testing	2	2016	4	2016

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Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) S54 / <i>Small Arms Improvement</i>			
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
S54: <i>Small Arms Improvement</i>	-	4.004	7.449	10.554	-	10.554	7.285	7.377	7.472	15.421	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

New starts in FY 2017 include Additive Manufacturing (3D Printing) and Small Arms Signature Suppression.

A. Mission Description and Budget Item Justification

The Small Arms Improvement Advanced Component Development and Prototypes (ACD&P) program provides funds to mature, demonstrate, test and evaluate emerging technology from Joint Service Small Arms Program (JSSAP), Project 627, Program Element 0603607A, (Budget Activity 3), Defense Advanced Research Projects Agency (DARPA), Department of Energy National Laboratories, Research Development & Engineering Centers (RDECs) and other domestic and foreign sources for small arms weapons systems and technology. Small arms systems include weapons ranging up to 40 millimeter in caliber. Current and future efforts focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, usability, training effectiveness and reliability of weapons to include ammunition when developing and/or evaluating standard and non-standard weapons. Focus areas include the maturing of technology through testing and evaluation of sub-system or system prototypes which demonstrates light weight materials, wear resistant/protective/anti-reflective coatings, observation/situational awareness improvements, human-systems integration, robotic armament capability and equipment enhancements. Benefits include continuous improvements to small arms weapons, fire control equipment, optics, gun barrels, training devices, suppressors, component mounts, weapon mounts, and weapon/ammunition interface. Includes costs associated with efforts for integration and interface of products on Soldiers' head, body and weapons.

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

	FY 2015	FY 2016	FY 2017
Title: New Weapons	0.505	1.122	1.733
Description: Description: Development of new small arms weapons			
FY 2015 Accomplishments: Next Generation Squad Automatic Rifle (NGSAR): Name changed from Next Generation Squad Weapon. Acquisition community assisted the United States Army Training and Doctrine Command (TRADOC) and Maneuver Center of Excellence (MCoE) in the development of Next Generation Squad Automatic Rifle requirements to include a potential replacement for the M249 in the Automatic Rifle role. Supported the Capability Development Document (CDD) and provided input to a Cost Benefit Analysis (CBA) for decision makers. Began development of the Capabilities Production Document (CPD) for the NGSAR.			

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2015	FY 2016	FY 2017
<p>Externally Powered Mounted Machine Gun: Research and Analysis. Evaluated and developed metrics for externally powered weapon stations requirements. Provided information/assistance to the MCoE in the preparation of an Externally Powered Weapon CDD.</p> <p>FY 2016 Plans: Next Generation Squad Automatic Rifle (NGSAR): Begin development of Acquisition Strategy, and plan to support CPD and provide Analysis of Alternatives for stakeholders.</p> <p>Externally Powered Mounted Machine Gun: Continue evaluation of metrics for externally powered weapon stations requirements. Provide engineering design and development activities to demonstrate capabilities of an Externally Powered Weapon system.</p> <p>FY 2017 Plans: Next Generation Squad Automatic Rifle (NGSAR): Will continue coordination and development of Acquisition Strategy, CDD, CPD, and provide data from various technologies to better inform stakeholders for transition to Infantry Support Weapons.</p> <p>Externally Powered Mounted Machine Gun: Will continue to provide engineering design and development activities to demonstrate capabilities of an Externally Powered Weapon system to inform MCoE on the CDD. Functional objectives include increased lethality, expansion of mission roles and operational utility (using a single weapon) through enhanced precision and multiple firing modes, lightening of the load, reduction in physical footprint, and minimization of required electrical power consumption. Emphasis will also be placed on maintaining a proper balance with operational implementation and manufacturing producibility of the Externally Powered Weapon.</p>				
<p>Title: Small Arms Weapons Enhancements</p> <p>Description: Description: Enhancements and developments of small arms weapons</p> <p>FY 2015 Accomplishments: Individual Non-Lethal System: Tested prototype systems and collected data for analysis.</p> <p>Increased Barrel Life/Replace Chrome: Continued to conduct barrel studies to improve/enhance barrel life and eliminate chrome-lined weapon parts. Monitored contract progress in developing prototype barrel liners. Developed test plan for barrels, conducted testing at Government facility.</p> <p>Non-Standard Weapons Assessments: Conducted market research of commercially available weapon systems that have characteristics for military suitability. List included weapons needed to support Regionally Aligned Forces (RAF) training mission of foreign non-standard weapons. Drafted test plans and initiated purchase of weapons for testing.</p>		0.275	1.085	1.686

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

	FY 2015	FY 2016	FY 2017
<p>Small Business Innovative Research (SBIR) Enhancements: Continued to evaluate proposed improvements designs to enhance lethality, target acquisition and tracking, fire control, training effectiveness and reliability of weapons.</p> <p>Protective Weapons Coating: Leveraged related work conducted by Oak Ridge National Labs and discoveries from prior SBIR efforts to develop manufacturing technology to support production of super-hydrophobic coatings in support of Fire Control Capability Development Document (CDD), Squad Annex. Determined key performance tolerances of coatings to determine manufacturing requirements, and conduct limited run production of sample fire control system components.</p> <p>Weapon Upgrades and Accessories: Continued to test, evaluate and analyze ongoing and new activities to enhance small arms weapons.</p> <p>FY 2016 Plans: Individual Non-Lethal System: Provide support to users for cost/benefit analysis and requirements preparation.</p> <p>Increased Barrel Life/Replace Chrome: Continue to conduct barrel studies to improve/enhance barrel life and eliminate chrome-lined weapon parts. Monitor contract progress in developing prototype barrel liners, receive barrels for testing. Begin limited testing at Government facility.</p> <p>Recoil Reduction Mechanisms: Evaluate Recoil Reduction Mechanisms to be selected for prototype fabrication for both individual and crew served weapons.</p> <p>Armaments for Robots: Initiate the intelligence/networking and weapons design and functions for a man-in-the-loop, small caliber defensive armaments system on an unmanned ground vehicle including the Warfighter/Robot interface.</p> <p>Small Arms Deployable Networks: Begin transition of a low cost, prototype munition from Armament Research, Development and Engineering Center (ARDEC) and integrate with a grenade launcher system. The munition will remotely deploy a sensor network comprised of grenade nodes containing an Electro Optical (EO) camera, acoustic and magnetic sensor components networked via robust ad-hoc wireless communications capable of transmitting streaming audio and imagery to provide increased situational awareness. Initiate a weapon platform analysis and a configuration study. Engage potential users and perform an evaluation of operational benefit for capability development.</p> <p>Non-Standard Weapons Assessments: Conduct baseline testing of commercial weapon systems and perform capability analysis of unique weapon characteristics. Test information will be used to conduct trade off assessments of Non-Developmental Item</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2015	FY 2016	FY 2017
<p>(NDI) solutions for pending requirements as well as establish safety parameters for the training mission of RAF. Continue to conduct market research of commercially available weapon systems.</p> <p>Small Business Innovative Research (SBIR) Enhancements: Continue to evaluate proposed improvements designs to enhance lethality, target acquisition and tracking, fire control, training effectiveness and reliability of weapons.</p> <p>Protective Weapons Coating: Continue to develop manufacturing technology to support production of super hydrophobic and other coatings in support of Small Arms Weapons.</p> <p>Weapon Upgrades and Accessories: Continue to test, evaluate and analyze ongoing and new activities to enhance small arms weapons.</p> <p>FY 2017 Plans: Increased Barrel Life/Replace Chrome: Will continue to conduct barrel studies to improve/enhance barrel life and eliminate chrome-lined weapon parts. Will monitor progress in the Small Arms Ammunition Configuration Study and evaluate the effects on future barrel life/chrome requirements, e.g., caliber change or higher pressures. Will develop needed technical approaches.</p> <p>Recoil Reduction Mechanisms: Transitions from Research and Analysis. Selected Recoil Reduction Mechanisms prototypes will be fabricated and tested for both individual and crew served weapons.</p> <p>Armaments for Robots: Will continue to initiate the intelligence/networking and weapons design and functions for a man-in-the-loop, small caliber defensive armaments system on an unmanned ground vehicle including the Warfighter/Robot interface.</p> <p>Small Arms Deployable Sensor Networks: Will continue research of a low cost, prototype munition from ARDEC and integrate with a grenade launcher system. The munition will remotely deploy a sensor network comprised of grenade nodes containing an Electro Optical (EO) camera, acoustic and magnetic sensor components networked via robust ad-hoc wireless communications capable of transmitting streaming audio and imagery to provide increased situational awareness.</p> <p>FY17 New Start: Additive Manufacturing (3D Printing): Transitions from Research and Analysis. Will be using 3D Printing methods to fabricate and test selected prototype weapon components for individual and crew served weapons.</p> <p>FY17 New Start: Small Arms Signature Suppression: Extend suppressor work conducted under Next Generation Squad Automatic Rifle Program to other individual and crew served weapons. Develop a standard interface for suppressors on all weapons. Examine reduced complexity/cost of suppressor components.</p>				

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2015	FY 2016	FY 2017
<p>Non-Standard Weapons Assessments: Will continue to conduct baseline testing of commercial weapon systems and perform capability analysis of unique weapon characteristics. Will continue to utilize test information to conduct trade off assessments of NDI solutions for pending requirements as well as establish safety parameters for the training mission of RAF. Will continue to conduct market research of commercially available weapon systems.</p> <p>Small Business Innovative Research (SBIR) Enhancements: Future efforts will continue to focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, training effectiveness and reliability of weapons.</p> <p>Protective Weapons Coating: Will continue to develop manufacturing technology to support production of super hydrophobic and other coatings in support of Small Arms Weapons.</p> <p>Weapon Upgrades and Accessories: Will continue to test, evaluate and analyze ongoing and new activities to enhance small arms weapons.</p>				
<p>Title: Ammunition</p> <p>Description: Description: Small arms ammunition improvement</p> <p>FY 2015 Accomplishments: Small Arms Ammunition Configuration Study: Completed development and approval of refined study plan, began execution of tasks to support evaluation of feasible technical approaches that mitigate capability gaps prescribed in the Small Arms Capabilities Based Assessment.</p> <p>FY 2016 Plans: Small Arms Ammunition Configuration Study: Continue execution of tasks to support evaluation of feasible technical approaches that mitigate capability gaps prescribed in the Small Arms Capabilities Based Assessment.</p> <p>FY 2017 Plans: Small Arms Ammunition Configuration Study: Will continue execution of tasks to support evaluation of feasible technical approaches that mitigate capability gaps prescribed in the Small Arms Capabilities Based Assessment.</p>		2.997	1.170	1.271
<p>Title: Combat Optics</p> <p>Description: Description: Improvement of small arms combat optics</p> <p>FY 2016 Plans:</p>		-	0.053	0.400

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2015	FY 2016	FY 2017
Optics Upgrades: Continue engineering evaluation, verification and validation of weapon optics performance requirements. FY 2017 Plans: Optics Upgrades: Will continue to evaluate state of the art advances in optical component technologies for inclusion in future products, including Mounted Machinegun Optic CPD, Fire Control CDD, and its associated annexes.				
Title: Fire Control Description: Description: Small arms fire control FY 2015 Accomplishments: Advanced Hyperspectral Target Acquisition (AHTA): Continued to evaluate and analyze advance approaches to acquire targets with the use of hyperspectral imaging and demonstrated capability. Precision Projectile Tracking: Refined projectile production methods and packaging. Illumination and imaging hardware were refined with software testing. Fire Control Upgrades: Initiated an overarching strategy to implement Fire Control Upgrades for Small Arms Weapons consisting of individual weapons, sniper and crew served weapons. FY 2016 Plans: Advanced Hyperspectral Target Acquisition (AHTA): Continue to evaluate and analyze advance approaches to acquire targets with the use of hyperspectral imaging and demonstrated capability. Precision Projectile Tracking: Continue to refine projectile production methods and packaging. Continue to refine illumination and imaging hardware to include software testing and validation. Complete firing of the prototypes with tracking verification. Dynamic Tracking for Fire Control: Leverage prototype development of Precision Projectile Tracking and Dynamic Tracking for Fire Control to begin system integration into one fire control device capable of both pre- and post- shot accuracy correction. Small Arms Ballistic Kernel: Validate ballistic models through live fire evaluation and expand models to incorporate future weapon platforms.		0.127	3.919	5.364

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2015	FY 2016	FY 2017
<p>Fire Control Upgrades: Work with the Infantry School to define the scope and assist in the development of CDD for the Army's Fire Control Upgrades for Small Arms Weapons consisting of individual weapons, sniper/precision, crew served weapons, and low-velocity 40mm.</p> <p>FY 2017 Plans: Small Arms Ballistic Kernel: Will integrate ballistic software into test hardware and platforms for validation of functionality. Will incorporate models for indirect 40mm weapon systems.</p> <p>Fire Control Upgrades: Will initiate testing of advanced fire control systems for small arms platforms to define the acquisition strategy in support of the CDD consisting of individual weapons, sniper/precision, crew served weapons, and low-velocity 40mm.</p>			
<p>Title: Research and Analysis</p> <p>Description: Research and analysis of small arms</p> <p>FY 2015 Accomplishments: Conducted Market Research and Benefit Analysis of ongoing small arms research initiatives to refine requirements and identify multiple solution sets.</p> <p>FY 2016 Plans: Initiate Market Research and Benefit Analysis of armaments for robots and other small arms research.</p> <p>FY 2017 Plans: Will initiate Market Research and Benefit Analysis of 360 degree situational awareness, active stabilization, advanced kinetic weapons, low flying drone engagement, and other small arms research.</p>	0.100	0.100	0.100
Accomplishments/Planned Programs Subtotals	4.004	7.449	10.554

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• Individual Weapons Engineering Deve: <i>RDTE S63, Program Element 0604601A - Infantry Support Weapons</i>	11.172	23.084	11.801	-	11.801	15.169	10.833	10.844	23.848	Continuing	Continuing
• Crew Served Weapons Engineering Dev: <i>RDTE EW4,</i>	-	-	14.447	-	14.447	15.566	14.270	14.689	25.838	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>

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

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
<i>Program Element 0604601A</i>											
<i>- Infantry Support Weapons</i>											
• Joint Service Small Arms	7.055	5.105	5.839	-	5.839	5.787	5.874	5.990	6.110	Continuing	Continuing
Program: <i>RDTE 627, Program Element 0603607A - Joint Service Small Arms Program (JSSAP)</i>											

Remarks

In support of Small Arms Initial Capability and Capability Development Requirements, advanced technology of Small Arms Weapons is transitioned from Joint Service Small Arms Program (JSSAP), Project 627, Program Element 0603607A, (Budget Activity 3) to Small Arms Improvement, Project S54, Program Element 0603827A, (Budget Activity 4). After the technology is demonstrated and/or validated, the program transitions to Infantry Support Weapons, Program Element 0604601A, (Budget Activity 5) for engineering and manufacturing development.

D. Acquisition Strategy

Primary strategy is to study, develop, demonstrate and evaluate emerging technologies that ultimately lead to enhancing/improving the small arms inventory.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603827A / Soldier Systems - Advanced Development				S54 / Small Arms Improvement							
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Allot	PM Soldier Weapons, : Picatinny Arsenal	2.515	0.254	Mar 2015	0.680	Dec 2015	1.389	Mar 2017	-		1.389	Continuing	Continuing	Continuing
Subtotal			2.515	0.254		0.680		1.389		-		1.389	-	-	-
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware Development	MIPR	Army Research Development Engineering Centers, : Multiple	9.521	-		1.150	Dec 2015	1.000	Mar 2017	-		1.000	Continuing	Continuing	Continuing
Subtotal			9.521	-		1.150		1.000		-		1.000	-	-	-
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering	MIPR	Army Research Development Engineering Centers, : Multiple	12.405	3.125	Mar 2015	4.085	Dec 2015	5.165	Mar 2017	-		5.165	Continuing	Continuing	Continuing
Subtotal			12.405	3.125		4.085		5.165		-		5.165	-	-	-
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Testing	MIPR	Army Test and Evaluation Centers, : Multiple	7.607	0.625	Mar 2015	1.534	Dec 2015	3.000	Mar 2017	-		3.000	Continuing	Continuing	Continuing

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
Next Generation Squad Automatic Rifle (NGSAR)																												
Externally Powered Mounted Machine Gun																												
Increased Barrel Life/Replace Chrome																												
Individual Non-Lethal System																												
Recoil Reduction Mechanisms																												
Armament for Robotics																												
Small Arms Deployable Sensor Networks																												
Additive Manufacturing (3D Printing)																												
Small Arms Signature Suppression																												
Non-Standard Weapon Studies																												
Small Business Innovative Research (SBIR)																												
Weapons Upgrades and Accessories																												
Small Arms Ammunition Configuration Study																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
Optics Upgrades																												
Advanced Hyperspectral Target Acquisition																												
Precision Projectile Tracking																												
Dynamic Tracking for Fire Control																												
Ballistic Kernel																												
Fire Control Upgrades																												
Research and Analysis of Small Arms																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Next Generation Squad Automatic Rifle (NGSAR)	1	2014	4	2017
Externally Powered Mounted Machine Gun	1	2015	4	2017
Increased Barrel Life/Replace Chrome	1	2011	4	2017
Individual Non-Lethal System	1	2013	4	2016
Recoil Reduction Mechanisms	1	2016	4	2018
Armament for Robotics	1	2016	4	2018
Small Arms Deployable Sensor Networks	1	2016	4	2017
Additive Manufacturing (3D Printing)	1	2017	4	2018
Small Arms Signature Suppression	1	2017	4	2021
Non-Standard Weapon Studies	4	2011	4	2021
Small Business Innovative Research (SBIR)	1	2015	4	2021
Weapons Upgrades and Accessories	1	2010	4	2021
Small Arms Ammunition Configuration Study	4	2014	2	2017
Optics Upgrades	1	2016	4	2021
Advanced Hyperspectral Target Acquisition	1	2014	4	2016
Precision Projectile Tracking	1	2015	4	2016
Dynamic Tracking for Fire Control	1	2016	4	2016
Ballistic Kernel	1	2016	4	2019
Fire Control Upgrades	1	2008	4	2021
Research and Analysis of Small Arms	1	2015	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army										Date: February 2016		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>			
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
VS4: <i>Soldier Protective Equipment</i>	-	2.629	5.408	16.294	-	16.294	11.711	8.224	2.869	2.647	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding supports efforts to evaluate integrated technologies and representative or prototype systems that help expedite Individual Soldier Ballistic Protection technology transition from the laboratory to operational use.

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

	FY 2015	FY 2016	FY 2017
Title: Soldier Protective Equipment	2.629	5.408	16.294
<p>Description: Funding line established in FY12. Effort was previously executed in Program Element 0603827 S53. Effort is to increase the Warfighter lethality and mobility by optimizing Soldier protection while effectively managing all life cycle aspects of Personal Protective Equipment (PPE).</p> <p>FY 2015 Accomplishments: Conducted human factors/limited user evaluations and subsystem development and characterization testing on the Soldier Protection System (SPS) Integrated Soldier Sensor System (ISSS) in 3QFY15. Transitioned ISSS components except ultra-low powered tunable narrow band wireless capability to VS5 System Development & Demonstration (SD&D) to buy Developmental Testing (DT)/Operational Testing (OT) test items by 2QFY16. Continued efforts to synchronize the integration of new and emerging technologies at the component and subsystem level focusing on reducing weight and bulk at the subsystem and component level. Continued to evaluate component and subsystem technologies and enabling technologies across the Personal Protection Equipment (PPE) portfolio (extremities, torso and vital torso, head, eye and face protection) to counter known and emerging ballistic/blast threats. Continued efforts to characterize and increase durability and functional service life of existing personal protective systems. Completed market research and obtained Materiel Change approval to modernize the Advanced Bomb Suit (ABS). Will then procure Non-Developmental Item (NDI) candidates in FY16 for qualification/integration with existing fielded ABS with VS5 SD&D funding. Completed characteristic testing of Integrated Head Protection System (IHPS). Initiated development and testing of an inspection device to detect delamination of ballistic inserts. Initiated development of scaling law and transfer function to inform Traumatic Brain Injury (TBI) mitigation criteria/requirements for Army helmets.</p> <p>FY 2016 Plans: Continue to evaluate component and subsystem technologies across the PPE portfolio (extremities, torso and vital torso, head, eye and face protection) to counter emerging ballistic/blast threats. Continue efforts to reduce SPS weight and bulk at the system, subsystem and component level. Efforts include reducing the Soldier Protection System (SPS) soft and hard armor</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>

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

	FY 2015	FY 2016	FY 2017
packages aerial density while maintaining same or better performance. Continue development and test of the self-diagnostic (smart) sensor capability for Vital Torso Protection (VTP) System. Continue efforts to characterize and increase durability and functional service life of existing personal protective systems at the subsystem/component level. Initiate technology development phase in support of SPS Increment 2 in late FY16. Procure SPS ISSS ultra-low powered tunable narrow band wireless prototypes to support FY16 initial human factors/limited user evaluation, and subsystem development, as well as characterization testing in 4QFY16 and transition to VS5 SD&D. Continue & complete development and testing of an automatic inspection device to detect delamination of ballistic inserts and scaling law and transfer function to inform Traumatic Brain Injury mitigation criteria/requirements for Army helmets and transition to VS5 SD&D. Initiate development of methodology for PPE shelf and service life, and initiate efforts to advance the novel modeling method for PPE performance through 4QFY17 and transition to VS5 SD&D.			
FY 2017 Plans: Initiate Technology/Maturation and Risk Reduction efforts across the PPE portfolio (extremities, torso and vital torso, head, eye and face protection, and sensors) to support SPS Generation II requirements for lighter weight ballistic materials with improved performance and manufacturing/testing process improvements. If ready, initiate proof-of-principle demonstrations on promising new technologies and or appliqué in simulated and instrumented field exercises (LEAP-A, etc.) to evaluate SPS upgrades and inform stakeholders of new operational capabilities to initiate SPS Generation II development. Continue efforts to characterize and increase durability and functional service life of existing personal protective systems at the subsystem/component level. Continue to develop the methodology for PPE shelf and service life, and to advance the novel modeling method for PPE performance. If ready, initiate proof-of-principle demonstrations on promising new technologies and or appliqué in simulated and instrumented field exercises (LEAP-A, etc.) to evaluate SPS upgrades and and component level integration improvements with legacy systems so as to inform stakeholders of new operational capabilities to initiate SPS Generation II development including emerging threat characterization. Develop improved blast testing standardization for existing EOD systems and emerging requirements including evaluation of subsystem technologies to counter EOD threats.			
Accomplishments/Planned Programs Subtotals	2.629	5.408	16.294

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

Line Item	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
• Soldier Protective Equipment VS5: RDTE, 0604601A.VS5, Soldier Protective Equipment	4.647	15.175	2.141	-	2.141	3.154	6.122	6.737	7.971	0.000	45.947
• Central Funding & Fielding: OMA, 121017, Central Funding & Fielding	126.972	64.631	96.468	-	96.468	74.833	75.368	63.753	76.563	0	578.588

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>

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

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

D. Acquisition Strategy

Programs pursue technology maturation and prototype development, culminating in the transition of mature technologies (TRL 6-7) to Engineering and Manufacturing Development. This project continues to exercise competitively awarded contracts using best value source selection procedures.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 4				PE 0603827A / Soldier Systems - Advanced Development				VS4 / Soldier Protective Equipment								
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
In House Support	C/CPFF	PM SPIE Various : Various	0.000	0.050		0.300		0.450		-		0.450	0	0.800	0	
Subtotal			0.000	0.050		0.300		0.450		-		0.450	0.000	0.800	0.000	
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Dev/Sys Engineering Spt	MIPR	Various : Various	3.952	-		1.500		2.707		-		2.707	Continuing	Continuing	0	
Dev/Integ Contracts	TBD	Various : various	11.232	0.940		1.908		7.550		-		7.550	Continuing	Continuing	Continuing	
Subtotal			15.184	0.940		3.408		10.257		-		10.257	-	-	-	
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Misc Support Costs	MIPR	Various : various	1.200	-		0.700		2.025		-		2.025	Continuing	Continuing	Continuing	
Subtotal			1.200	-		0.700		2.025		-		2.025	-	-	-	
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
DT (Ballistic/Non-ballistic) Testing	MIPR	Various : Various	0.589	1.639		1.000		3.562		-		3.562	Continuing	Continuing	Continuing	
Subtotal			0.589	1.639		1.000		3.562		-		3.562	-	-	-	
Project Cost Totals			16.973	2.629		5.408		16.294		-		16.294	-	-	-	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army							Date: February 2016			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>			Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>				
	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army **Date:** February 2016

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
Continue SPS ISSS Subsystem Development																												
Conduct SPS ISSS DTI (HFE, Limited User Evals)																												
(1) Transition mature ISSS Components to VS5					▲ 1																							
(2) Obtain Materiel Change approval of ABS	▲ 2																											
SPS Technology Maturation																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2017 Army		Date: February 2016
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Continue SPS ISSS Subsystem Development	1	2014	1	2016
Conduct SPS ISSS DTI (HFE, Limited User Evals)	2	2015	3	2015
Transition mature ISSS Components to VS5	1	2016	2	2016
Obtain Materiel Change approval of ABS	3	2015	3	2015
SPS Technology Maturation	1	2017	3	2019

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