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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army **Date:** March 2019

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	60.774	31.022	22.113	-	22.113	26.161	30.974	33.992	28.562	Continuing	Continuing
CF2: <i>Integrated Soldier Systems Prototyping (SL CFT)</i>	-	0.000	0.000	1.959	-	1.959	2.543	3.152	3.774	3.847	0.000	15.275
ET8: <i>Personnel Airdrop System Development</i>	-	0.476	0.396	0.297	-	0.297	1.267	1.265	1.813	1.000	Continuing	Continuing
S53: <i>Clothing And Equipment</i>	-	2.532	1.823	2.466	-	2.466	1.810	2.416	4.478	5.078	Continuing	Continuing
S54: <i>Small Arms Improvement</i>	-	27.832	7.677	14.555	-	14.555	16.097	19.232	17.439	10.487	0.000	113.319
VS4: <i>Soldier Protective Equipment</i>	-	29.934	21.126	2.836	-	2.836	4.444	4.909	6.488	8.150	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE), Advanced Component Development and Prototypes, manages the Soldier as a system to increase combat effectiveness, test and deliver tangible products that save Soldiers lives and improve combat capability. The PE provides funding for evaluating, developing, and testing emerging technologies and critical Soldier support systems to reduce technology risk.

CF2

The Integrated Squad effort includes the completion of the Adaptive Squad Architecture (ASA) and Squad Performance Model (SPM) programs. Both of these efforts are Program Executive Office-Soldier (PEO-S) led and will develop a full system architecture for the Soldier and the Squad. This will be accomplished by developing Interface Control Documents (ICDs) in order to provide common established interfaces for internal and external stakeholders who will interface on or with the Soldier platform. A critical part of this effort is development of the "Squad as an Integrated Platform" vision based on threat, operational environment and collaboration with internal and external stakeholders to inform investment decisions out to FY2050. The ASA will develop a metric-based approach that will include live, virtual and constructive evaluations and tools across the DoD, academia and industry which will be used for senior leaders to make deliberate decisions based on the analysis of Soldier/ Squad performance

ET8

Personnel Airdrop System, supports efforts to improve Low Altitude and High Altitude personnel parachutes and associated equipment to include canopy improvement 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.

S53

This Project supports efforts to evaluate and integrate technologies and representative or prototype systems that help expedite Soldier Clothing and Individual Equipment technology transition from the laboratory to operational use. Efforts focus on proving out commonality across as broad a spectrum of users as possible to

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army				Date: March 2019		
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army I BA 4: Advanced Component Development & Prototypes (ACD&P)		R-1 Program Element (Number/Name) PE 0603827A I Soldier Systems - Advanced Development				
provide a modular, integrated uniform/clothing system from skin out and head-to-toe. It funds efforts to transition new technologies and domestically available fabrics with Flame Resistant (FR), moisture wicking, insect protection and camouflage technologies, including integration of fabrics appropriate for uniforms and equipment used in jungle/tropical and arctic environments. New technologies are indentified 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.						
S54 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 weapon systems and technology. Small arm weapon 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, non-lethal capability, and equipment enhancements. Benefits include continuous improvements to small arms weapon systems, 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.						
VS4 This Project supports efforts to evaluate integrated technologies and representative or prototype systems that help expedite Personal Protective Equipment (PPE) technology transition from the laboratory to operational use.						
B. Program Change Summary (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget		20.239	18.044	16.165	-	16.165
Current President's Budget		60.774	31.022	22.113	-	22.113
Total Adjustments		40.535	12.978	5.948	-	5.948
• Congressional General Reductions		-0.014	-0.022			
• Congressional Directed Reductions		-	-			
• Congressional Rescissions		-	-			
• Congressional Adds		35.000	13.000			
• Congressional Directed Transfers		-	-			
• Reprogrammings		6.248	-			
• SBIR/STTR Transfer		-0.699	-			
• Adjustments to Budget Years		-	-	5.948	-	5.948
Change Summary Explanation						
FY 2018 funding includes a \$20.000 million congressional add for Project S54 and a \$15.000 million congressional add for Project VS4.						

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Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development	
FY 2019 funding includes a \$13.000 million congressional add for Project VS4. FY 2020 funding request reflects an increase of \$5.948 million to account for the new start of Project CF2 and increased funding in Project S53.		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) CF2 / Integrated Soldier Systems Prototyping (SL CFT)			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
CF2: Integrated Soldier Systems Prototyping (SL CFT)	-	0.000	0.000	1.959	-	1.959	2.543	3.152	3.774	3.847	0.000	15.275
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project CF2 is a new start beginning in FY 2020. This program supports the Cross Functional Team (CFT).

A. Mission Description and Budget Item Justification

The Integrated Squad effort includes the completion of the Adaptive Squad Architecture (ASA) and Squad Performance Model (SPM) programs. Both of these efforts are Program Executive Office-Soldier (PEO-S) led and will develop a full system architecture for the Soldier and the Squad. This will be accomplished by developing Interface Control Documents (ICDs) in order to provide common established interfaces for internal and external stakeholders who will interface on or with the Soldier platform. A critical part of this effort is development of the "Squad as an Integrated Platform" vision based on threat, operational environment and collaboration with internal and external stakeholders to inform investment decisions out to FY2050. The ASA will develop a metric-based approach that will include live, virtual and constructive evaluations and tools across the DoD, academia and industry which will be used for senior leaders to make deliberate decisions based on the analysis of Soldier/ Squad performance.

FY20 RDTE funding in the amount of \$1.959M will finalize an initial ASA and SPM, consisting of 3 critical products: the Configuration Database (CD), the Architectural Assessment Tool (AAT) and the SPM.

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

	FY 2018	FY 2019	FY 2020
Title: Integrated Soldier Systems Prototyping	-	-	1.959
Description: Verify and maintain tools that provide Systems Engineering, Configuration Management, and Evaluations in a virtual and physical environment. Verify and maintain the ASA and SPM with emphasis on development of ICDs, specifically to support the rapid integration of the Soldier Lethality Cross Functional Team (SL CFT) priority programs with all other equipment the dismounted Soldier will use. Provide prototyping of capabilities for evaluation and integration. Execute evaluation of new measurements and methodologies from the S&T community, execute system level evaluation environments, and support Soldier system modeling.			
FY 2020 Plans: FY 2020 Plans: Finalize operational version of ASA and SPM			
FY 2019 to FY 2020 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) CF2 / Integrated Soldier Systems Prototyping (SL CFT)				
B. Accomplishments/Planned Programs (\$ in Millions)										FY 2018	FY 2019	FY 2020
New start. Critical task of Adaptive Squad Architecture will be to allow Army Futures Command, Soldier Lethality Cross Functional Team, and PEO Soldier leadership to make immediate quantitative analysis of proposed components (ie next-gen weapons, future body-armor, etc) for acquisition.												
Accomplishments/Planned Programs Subtotals										-	-	1.959
C. Other Program Funding Summary (\$ in Millions)												
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost	
• CF3: Integrated Soldier Systems (SL CFT)	-	-	4.504	-	4.504	4.601	4.429	4.502	4.584	0.000	22.620	
Remarks												
D. Acquisition Strategy												
Develop and validate the verification and operation of the ASA tools (Configuration Database (CD), Architectural Assessment Tool (AAT), Squad Performance Model (SPM)) under full and open competition. Attempt to utilize one vendor for, at a minimum, maintenance of the CD and AAT. Conduct evaluations to support the SPM, with the Government acting as the lead developer.												
E. Performance Metrics												
N/A												

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army													Date: March 2019		
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)					
2040 / 4				PE 0603827A / Soldier Systems - Advanced Development						CF2 / Integrated Soldier Systems Prototyping (SL CFT)					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Adaptive Soldier Architecture (ASA) Squad Performance Model (SPM)	C/FFP	TBD : TBD	-	-		-		0.500	Jan 2020	-		0.500	Continuing	Continuing	Continuing
Subtotal			-	-		-		0.500		-		0.500	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
ASA/SPM Test & Eval	C/FFP	TBD : TBD	-	-		-		1.459		-		1.459	Continuing	Continuing	Continuing
Subtotal			-	-		-		1.459		-		1.459	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		0.000		1.959		-		1.959	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army																Date: March 2019																					
Appropriation/Budget Activity 2040 / 4										R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development								Project (Number/Name) CF2 / Integrated Soldier Systems Prototyping (SL CFT)																			
Event Name										FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
										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
Soldier Lethality Support																																					

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development	Project (Number/Name) CF2 / Integrated Soldier Systems Prototyping (SL CFT)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Soldier Lethality Support	2	2020	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) ET8 / Personnel Airdrop System Development			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
ET8: Personnel Airdrop System Development	-	0.476	0.396	0.297	-	0.297	1.267	1.265	1.813	1.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note This program supports the Cross Functional Team (CFT).												
A. Mission Description and Budget Item Justification Project ET8, Personnel Airdrop System, supports efforts to improve Low Altitude and High Altitude personnel parachutes and associated equipment to include canopy improvement 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.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2018	FY 2019	FY 2020	
Title: Personnel Airdrop System Development									0.476	0.396	0.297	
Description: Effort to improve Low Altitude and High Altitude 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.												
FY 2019 Plans: Continue to investigate and initiate improvements to address reduced signature of parachute systems for high altitude operations.												
FY 2020 Plans: Evaluate Low Altitude Static Line Automatic Activation Devices as well as Universal Static Line smart snap hook and Jumper Recovery Systems.												
FY 2019 to FY 2020 Increase/Decrease Statement: Funding change in Personnel Airdrop System Development portfolio is due to anticipated requirement changes in FY 2019 and FY 2020.												
Accomplishments/Planned Programs Subtotals									0.476	0.396	0.297	

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019	
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>			
C. Other Program Funding Summary (\$ in Millions)											
			<u>FY 2020</u>	<u>FY 2020</u>	<u>FY 2020</u>					<u>Cost To</u>	
<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>Base</u>	<u>OCO</u>	<u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Complete</u>	<u>Total Cost</u>
• ES9: <i>Advanced Tactical Parachute System</i>	5.607	6.702	6.617	-	6.617	1.829	2.965	2.964	3.000	0.000	29.684
• MA7801: <i>Advanced Tactical Parachute System</i>	28.440	41.104	43.622	-	43.622	53.077	47.805	39.849	39.017	0.000	292.914
Remarks											
D. Acquisition Strategy											
Programs pursue technology maturation and prototype development, culminating in the transition of mature technologies (Technology Readiness Level (TRL) 6-7) to system development and demonstration (SDD).											
E. Performance Metrics											
N/A											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) ET8 / Personnel Airdrop System Development					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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 Contracts	C/FFP	TBD : TBD	-	-		-		0.098		-		0.098	2.605	2.703	-
Engineering Support	MIPR	NSRDEC Natick, MA : various	0.234	0.226		-		0.100		-		0.100	1.404	1.964	-
Subtotal			0.234	0.226		-		0.198		-		0.198	4.009	4.667	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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 Support	Allot	PM SCIE : Belvoir	0.180	0.065		0.040		0.099		-		0.099	1.336	1.720	-
Subtotal			0.180	0.065		0.040		0.099		-		0.099	1.336	1.720	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Bench top testing	MIPR	TBD : TBD	0.250	0.185		0.356		-		-		-	0.000	0.791	-
Subtotal			0.250	0.185		0.356		-		-		-	0.000	0.791	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.664	0.476		0.396		0.297		-		0.297	5.345	7.178	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army			Date: March 2019		
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>	

Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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																												
RA-1 Signature Reduction Testing																												
SL Canopy Release Assembly Testing																												
Next Generation O2 Laboratory Testing																												
Transition S&T for USL snap hook towed Jumper recovery system																												
Evaluate USL & Jumper Recovery Systems																												
S&T transition of Alternative Materiel Hardware for RA-1, T-11 & MC-6																												
Evaluate new composite material for lighter weight parachute hardware																												
Transition Parachutist Non-GPS Navigation Aid																												
Evaluate Transition Parachutist Non-GPS Navigation Aid																												
Transition High Altitude Combo Drops																												
Evaluate High Altitude Combo Drops																												
Transition S&T for Low Altitude Static Line Automatic Activation Devices																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army																Date: March 2019												
Appropriation/Budget Activity 2040 / 4									R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development								Project (Number/Name) ET8 / Personnel Airdrop System Development											
Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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 Low Altitude Static Line Automatic Activation Devices																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army			Date: March 2019
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	2018	4	2023
RA-1 Signature Reduction Testing	1	2018	4	2020
SL Canopy Release Assembly Testing	1	2023	4	2023
Next Generation O2 Laboratory Testing	1	2023	3	2025
Transition S&T for USL snap hook towed Jumper recovery system	4	2021	4	2021
Evaluate USL & Jumper Recovery Systems	4	2021	2	2022
S&T transition of Alternative Materiel Hardware for RA-1, T-11 & MC-6	4	2022	4	2022
Evaluate new composite material for lighter weight parachute hardware	1	2022	4	2023
Evaluate Transition Parachutist Non-GPS Navigation Aid	1	2021	1	2026
Transition High Altitude Combo Drops	1	2022	1	2022
Evaluate High Altitude Combo Drops	1	2022	3	2022
Transition S&T for Low Altitude Static Line Automatic Activation Devices	2	2020	2	2020
Evaluate Low Altitude Static Line Automatic Activation Devices	2	2020	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) S53 / Clothing And Equipment			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
S53: Clothing And Equipment	-	2.532	1.823	2.466	-	2.466	1.810	2.416	4.478	5.078	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note This program supports the Cross Functional Team (CFT).												
A. Mission Description and Budget Item Justification This Project supports efforts to evaluate and integrate technologies and representative or prototype systems that help expedite Soldier Clothing and Individual Equipment 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 transition new technologies and domestically available fabrics with Flame Resistant (FR), moisture wicking, insect protection and camouflage technologies, including integration of fabrics appropriate for uniforms and equipment used in jungle/tropical and arctic environments. New technologies are indentified 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 2018	FY 2019	FY 2020	
Title: Soldier Uniforms and Clothing									1.962	1.765	1.972	
Description: Develop superior and sustainable integrated clothing for the Soldier in a rapidly changing global environment.												
FY 2019 Plans: Develop improved Boot Water Absorption test methodology. Evaluate improved lighter weight textiles which incorporate improved vector protection, FR protection, and environmental protection while providing comfort, utility, and functionality. Evaluate materials to support extreme cold temperature protection for military free fall parachutists. Standardize test methodology for cold weather glove system. Improve Hot Weather Combat Uniform Female (IHWCU-F) Pattern adjustment for creation of female sizes.												
FY 2020 Plans: Continue Flame Resistant clothing upgrades. Continue Signature Management evaluation in Camouflage equipment. Continue to evaluate improved lighter weight textiles which incorporate improved vector protection, FR protection, and environmental protection while providing comfort, utility, and functionality. Also, continue to evaluate materials to support extreme cold temperature protection for military free fall parachutists. The S&T transition for environmental cold/wet protection clothing system is planned.												
FY 2019 to FY 2020 Increase/Decrease Statement:												

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army							Date: March 2019				
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)											
Funding change in Soldier Uniforms and Clothing portfolio is due to anticipated requirement changes in FY 2019 and FY 2020.							FY 2018	FY 2019	FY 2020		
Title: Individual Equipment Description: Develop and provide superior and sustainable integrated individual equipment for the Soldier in a rapidly changing global environment. FY 2020 Plans: Develop process and procedures for the Dyeing of Aramid Blends, used in environmental clothing. FY 2019 to FY 2020 Increase/Decrease Statement: Minor increase to support testing.							0.570	-	0.494		
Title: FY 2019 SBIR/STTR TRANSFER Description: FY 2019 SBIR/STTR TRANSFER FY 2019 Plans: FY 2019 SBIR/STTR TRANSFER FY 2019 to FY 2020 Increase/Decrease Statement: FY 2019 SBIR/STTR TRANSFER							-	0.058	-		
Accomplishments/Planned Programs Subtotals							2.532	1.823	2.466		
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• S60: <i>Clothing & Equipment</i>	6.780	8.348	6.453	-	6.453	6.724	5.015	4.850	3.700	0.000	41.870
Remarks											
D. Acquisition Strategy											
Programs pursue technology maturation and prototype development, culminating in the transition of mature technologies (Technology Readiness Level (TRL) 6-7) to Systems Development and Demonstration. 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 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) S53 / Clothing And Equipment					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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 Support	TBD	PM SPIE : Ft. Belvoir, VA	15.287	0.208		0.235		0.296		-		0.296	Continuing	Continuing	Continuing
Subtotal			15.287	0.208		0.235		0.296		-		0.296	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	15.928	0.410		-		0.441		-		0.441	Continuing	Continuing	Continuing
Development Contracts	C/FFP	Various : Various	33.725	0.724		-		0.588		-		0.588	Continuing	Continuing	Continuing
FY 2019 SBIR /STTR Transfer	TBD	TBD : TBD	-	-		0.058		-		-		-	0.000	0.058	-
Subtotal			49.653	1.134		0.058		1.029		-		1.029	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	Natick,MA : Natick, MA	8.077	0.325		0.725		0.296		-		0.296	Continuing	Continuing	Continuing
Subtotal			8.077	0.325		0.725		0.296		-		0.296	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	26.049	0.865		0.805		0.845		-		0.845	Continuing	Continuing	Continuing
Subtotal			26.049	0.865		0.805		0.845		-		0.845	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army										Date: March 2019			
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>			
	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	99.066	2.532		1.823		2.466		-		2.466	Continuing	Continuing	N/A
Remarks													

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army			Date: March 2019		
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>	

Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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																												
IHWCU-F																												
Flame Resistant Clothing Upgrades																												
Improve Signature Mgmt (IR) Eval & Camo in Clothing & Equi																												
CW/ECW Clothing Improvements																												
CW/ECW Handwear																												
CW/ECW Footwear																												
INDIVIDUAL EQUIPMENT																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army			Date: March 2019
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>	

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
UNIFORM CLOTHING	1	2010	4	2023
IHWCU-F	1	2020	4	2020
Flame Resistant Clothing Upgrades	1	2011	4	2023
Improve Signature Mgmt (IR) Eval & Camo in Clothing & Equipment	2	2012	4	2024
CW/ECW Clothing Improvements	1	2020	4	2022
CW/ECW Handwear	1	2020	4	2020
CW/ECW Footwear	1	2020	4	2020
INDIVIDUAL EQUIPMENT	4	2015	4	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) S54 / Small Arms Improvement			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
S54: Small Arms Improvement	-	27.832	7.677	14.555	-	14.555	16.097	19.232	17.439	10.487	0.000	113.319
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note												
This program supports the Cross Functional Team (CFT).												
FY 2020 New starts include the following programs: Individual Non-Lethal System (funded in FY 2017), Non-Standard Weapons Assessments (funded in FY 2017), Solid State Active Denial System, Current and Legacy Weapon Improvements, and Next Generation Optics.												
Name change: Next Generation Squad Automatic Rifle is renamed Next Generation Squad Weapon-Automatic Rifle (NGSW-AR) and Small Arms Fire Control (SAFC)-Squad combined with SAFC-Crew are now referred to as Next Generation Fire Control.												
Previously funded efforts in this Project: Recoil Reduction Mechanisms, Lightweight Rifle/Machine Gun Barrel Evaluations, and Rifle/Machine Gun Suppressor Evaluations, Protective Weapons Coatings, and Weapon Upgrades and Accessories are now funded under Current and Legacy Weapon Improvements. Armaments for Robots is now funded under Externally Powered Weapon. Optics Upgrades is now covered under Next Generation Optics. Sniper Missed Distance Corrective Offset, Small Arms Fire Control Crew Enhancements, Small Arms Fire Control Precision Enhancements, and Fire Control Upgrades are now funded under Next Generation Fire Control.												
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 weapon systems and technology. Small arm weapon 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, non-lethal capability, and equipment enhancements. Benefits include continuous improvements to small arms weapon systems, 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 2018	FY 2019	FY 2020	
Title: New Weapon Systems									21.200	0.800	2.505	

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019		
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 2018	FY 2019	FY 2020
<p>Description: Development of new small arms weapon systems</p> <p>FY 2019 Plans: Next Generation Squad Automatic Rifle (NGSAR): Transition of technologies from Program Element 0603827A, Project S54 to Program Element 0604601A, Project EW4. Coordinating and developing the Capability Development Document (CDD), Acquisition Strategy, Capability Production Document (CPD), and provide data from various technologies to better inform stakeholders. Beginning EMD phase for the Next Generation Squad Automatic Rifle.</p> <p>Externally Powered Mounted Machine Gun renamed to Externally Powered Weapon (EPW). Continuing to support the development of the Capability Development Document (CDD) with Maneuver Center of Excellence and Maneuver Support Center of Excellence. Intent is to leverage information gathered from prototype testing and develop a demonstrator to better evaluate and inform the CDD and the various platforms that may include the EPW as their Armament System.</p> <p>New Weapons Evaluations and Assessments: Continuing to perform initial evaluation and assessment of new weapons.</p> <p>FY 2020 Plans: Externally Powered Weapon (EPW): Will continue to support the development of the Capability Development Document (CDD) with Maneuver Center of Excellence and Maneuver Support Center of Excellence. Intend to leverage information gathered from prototype testing and develop a demonstrator to better evaluate and inform the CDD and the various platforms that may include the EPW as their Armament System. Will 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>New Weapon Systems Evaluations and Assessments: Will continue to perform initial evaluation and assessment of new weapon systems.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY 2020 Increase in funds required to reduce technology risk and to determine the appropriate set of technologies required to complete the Next Generation Squad Weapons technology development phase.</p>					
<p>Title: Small Arms Weapon Systems Enhancements</p> <p>Description: Enhancements and developments of small arms weapon systems.</p> <p>FY 2019 Plans: Recoil Reduction Mechanisms: Continuing to assess and evaluate selected Recoil Reduction Mechanisms prototypes to be fabricated and tested for both individual and crew served weapons.</p>			-	0.100	7.650

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019	
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 2018	FY 2019
<p>Armaments for Robots: Continuing 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>Increased Barrel Life/Replace Chrome: Continuing test and evaluation of prototype barrels delivered in FY 2017 to pursue barrel and liner designs that can withstand higher pressures per the Small Arms Ammunition Configuration Study outputs. Further investigate and mature additive manufacturing and cold spray methodology for barrels.</p> <p>Non-Standard Weapons Assessments: Continuing to conduct baseline testing of commercial weapon systems and perform capability analysis of unique weapon characteristics. Continuing to utilize test information to conduct trade off assessments of Non-Developmental Item solutions for pending requirements as well as establish safety parameters for the training mission of Regionally Aligned Forces and establish a sustainment strategy for long term support of weapons procured to support the Regionally Aligned Forces training mission. Continuing to conduct market research of commercially available weapon systems.</p> <p>Small Business Innovative Research Enhancements: Continuing to focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, training effectiveness and reliability of weapons.</p> <p>Protective Weapons Coatings: (includes Adaptive Lubricious Coatings): Continuing to develop manufacturing technology to support production of super hydrophobic and other coatings in support of Small Arms Weapons. Assessing and evaluating current manufacturing process studies and assessments to adapt the coating technology into weapon Original Equipment Manufacturer manufacturing processes.</p> <p>Weapon Upgrades and Accessories: Continuing to test, evaluate and analyze ongoing and new activities to enhance small arms weapons.</p> <p>FY 2020 Plans:</p> <p>FY2020 New Start: Current and Legacy Weapon Improvements: Will assess and evaluate selected capabilities and improvements for all current and legacy weapon systems.</p> <p>FY2020 New Start: Solid State Active Denial System: Will work to complete maturation of design, continue to monitor status of Capability Development Document and provide input into programmatic documents as necessary.</p> <p>FY2020 New Start: Individual Non-Lethal System: Will work to complete maturation of design and get it ready for prove out test at Government facility in support of Milestone B. Previously funded in FY 2017.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development	Project (Number/Name) S54 / Small Arms Improvement		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
FY2020 New Start: Non-Standard Weapons Assessments: Will continue to conduct baseline testing of commercial weapon systems and perform capability analysis of unique weapon characteristics. Continue to utilize test information to conduct trade off assessments of Non-Developmental Item solutions for pending requirements as well as establish safety parameters for the training mission of Regionally Aligned Forces and establish a sustainment strategy for long term support of weapons procured to support the Regionally Aligned Forces training mission. Continues to conduct market research of commercially available weapon systems. Previously funded in FY 2017.				
Small Business Innovative Research Enhancements: Will continue future efforts continues to focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, training effectiveness and reliability of weapons.				
FY 2019 to FY 2020 Increase/Decrease Statement: FY 2020 Increase in funds required to reduce technology risk and to determine the appropriate set of technologies required to complete the Next Generation Squad Weapons technology development phase.				
Title: Ammunition Description: Small arms ammunition improvement.		-	0.100	0.100
FY 2019 Plans: Ammunition Upgrades: Continuing to evaluate the effect of new ammunition on small arms weapons.				
FY 2020 Plans: Ammunition Upgrades: Will continue to evaluate the effect of new ammunition on small arms weapon systems.				
Title: Combat Optics Description: Improvement of small arms combat optics.		0.508	0.100	0.100
FY 2019 Plans: Optics Upgrades: Continuing to evaluate state of the art advances in optical component technologies for inclusion in future products, including Mounted Machinegun Optic Capability Production Document, Fire Control Capability Development Document, and its associated annexes.				
FY 2020 Plans: FY2020 New Start: Next Generation Optics: Will integrate current and emerging target acquisition component technologies into a variable magnification spotting scope and into binoculars.				
Title: Fire Control		6.124	6.095	4.000

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019		
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 2018	FY 2019	FY 2020
<p>Description: Small arms fire control.</p> <p>FY 2019 Plans: FY 2019 New start: Next Generation Fire Control (Crew Served and Squad) Technology Enhancements: Continuing support and oversight for exploring future fire control applications for Next Generation Squad Weapons objective requirements, Small Business innovation Research, and digital enhancements. Future applications specifically address aim augmentation, target tracking and handoff, automatic target detection/identification/recognition, integrated day/night capability, integrated wind sensor, secure wireless transmission, environmental sensing, and optical enhancements.</p> <p>Next Generation Spotting Scope: Continuing to consolidate readily available and mature fire-control/target acquisition component technologies into a variable magnification spotting scope.</p> <p>Next Generation Binocular: Continuing to assess and evaluate incorporating existing target acquisition/fire control component technologies into binoculars.</p> <p>Sniper Missed Distance Corrective Offset: Continuing to assess and evaluate from a sniper team (shooter's) location, tracks sniper's bullet trace to target to derive a missed distance correct offset for a follow-on shot.</p> <p>Next Generation Fire Control: Continuing to conduct prototyping activities to advance fire control technologies on carbine and rifle weapon platforms. Will address Size, Weight, and Power trade space challenges associated with fire control on the individual squad weapons. Transitioning to Program Element 0604601A Project FF2 Small Arms Fire Control.</p> <p>Small Arms Fire Control-Precision/Enhancements: Continuing to support and explore future precision fire control enhancements which includes: target detection to improve battlefield reconnaissance and intelligence gathering capabilities, improve target acquisitions at extended ranges in all battlefield conditions, improve anti-reflection (AR) coating to minimize scope glints, and counter optical augmentation that can disclose soldiers' location, target tracking, down range wind sensing technology, bullet tracking, weapon bore sensor, automated muzzle velocity tracker to improve fire control accuracy, far-target location, battlefield networking, and augmented reality. To provide support to Small Business Innovative Research efforts that will explore the feasibility, scientific merit, research and development, and commercialization of future Precision fire control system.</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019	
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 2018	FY 2019
<p>Fire Control Upgrades: Continuing to test advanced fire control systems for small arms platforms to define the acquisition strategy in support of the Capability Development Document consisting of individual weapons, sniper/precision, crew served weapons, low and high velocity 40mm.</p> <p>FY 2020 Plans: Next Generation Fire Control Technology Enhancements: Will continue to support technology integration with Next Generation Squad Weapons, and specifically address decrease soldier aim error, decrease engagement time and increase probability of hit. Prototype demonstrations will have application in individual and crew served weapons to enhance and upgrade Fire Control.</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY 2020 Increase in funds required to reduce technology risk and to determine the appropriate set of technologies required to complete the Next Generation Squad Weapons technology development phase.</p>			
<p>Title: Research and Analysis</p> <p>Description: Research and analysis of small arms.</p> <p>FY 2019 Plans: Continuing to 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> <p>FY 2020 Plans: Will continue to 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>		-	0.200
<p>Title: FY2019 SBIR / STTR Transfer</p> <p>FY 2019 Plans: FY2019 SIBR/STTR Transfer</p> <p>FY 2019 to FY 2020 Increase/Decrease Statement: FY2019 SIBR/STTR</p>		-	0.282
Accomplishments/Planned Programs Subtotals		27.832	14.555

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019	
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) S54 / Small Arms Improvement			
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• EW4: Crew Served Weapons Engineering Development	12.999	11.102	2.589	-	2.589	15.767	14.789	13.927	9.029	0.000	80.202
• FF2: Small Arms Fire Control	17.914	10.188	21.463	-	21.463	10.163	11.254	8.000	10.000	0.000	88.982
• FI2: Lightweight 30mm Cannon	8.280	-	1.384	-	1.384	-	-	-	-	0.000	9.664
• FM4: Next Generation Squad Weapons	-	-	33.080	-	33.080	36.880	13.780	15.470	16.060	0.000	115.270
• S63: Individual Weapons Engineering Development	9.664	5.749	7.076	-	7.076	15.377	7.918	6.284	0.974	0.000	53.042
• FL4: Small Caliber Ammo for Next Gen Squad Weapons	-	-	22.880	-	22.880	30.630	28.750	25.000	11.750	0.000	119.010
• 627: Jt Svc Sa Prog (JSSAP)	5.628	5.879	0.000	-	0.000	-	-	-	-	0.000	11.507
Remarks											
In support of Small Arms Initial Capability and Capability Development Requirements, advanced technology of small arms weapon systems 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 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) S54 / Small Arms Improvement					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	4.838	2.066	Mar 2018	0.570	Mar 2019	0.590	Mar 2020	-		0.590	Continuing	Continuing	Continuing
FY2019 SBIR / STTR Transfer	FFRDC	Army Budget Office : Pentagon, Washington DC	-	-		0.282	Nov 2018	-		-		-	Continuing	Continuing	Continuing
Subtotal			4.838	2.066		0.852		0.590		-		0.590	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	11.375	22.348	Mar 2018	3.680	Mar 2019	9.755	Mar 2020	-		9.755	Continuing	Continuing	Continuing
Subtotal			11.375	22.348		3.680		9.755		-		9.755	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	24.780	2.271	Mar 2018	1.450	Mar 2019	2.240	Mar 2020	-		2.240	Continuing	Continuing	Continuing
Subtotal			24.780	2.271		1.450		2.240		-		2.240	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) S54 / Small Arms Improvement					
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	13.861	1.147	Mar 2018	1.695	Mar 2019	1.970	Mar 2020	-		1.970	Continuing	Continuing	Continuing
Subtotal			13.861	1.147		1.695		1.970		-		1.970	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			54.854	27.832		7.677		14.555		-		14.555	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army	Date: March 2019
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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>
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Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
NEW WEAPON SYSTEMS																												
Next Generation Squad Weapon-Automatic Rifle																												
Next Generation Squad Weapon-Rifle																												
Externally Powered Weapon (EPW)																												
New Weapon Systems Evaluations and Assessments																												
SMALL ARMS WEAPON SYSTEMS ENHANCEMENTS																												
Solid State Active Denial System																												
Current and Legacy Weapon Improvements																												
Individual Non-Lethal System																												
Non-Standard Weapon Assessments																												
Small Business Innovative Research																												
Protective Weapons Coatings (includes Adaptive Lubricious Coatings)																												
Weapons Upgrades and Accessories																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army	Date: March 2019
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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>
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Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
AMMUNITION																												
Ammunition Upgrades																												
COMBAT OPTICS																												
Next Generation Optics																												
Optics Upgrades																												
FIRE CONTROL																												
Next Generation Fire Control Technology Enhancements																												
Next Generation Fire Control																												
Small Arms Fire Control Precision/Enhancements																												
Small Arms Fire Control Upgrades																												
RESEARCH AND ANALYSIS																												
Research and Analysis of Small Arms																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army			Date: March 2019
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
NEW WEAPON SYSTEMS	1	2008	4	2024
Next Generation Squad Weapon-Automatic Rifle	1	2014	4	2019
Next Generation Squad Weapon-Rifle	2	2019	4	2020
Externally Powered Weapon (EPW)	1	2015	4	2021
New Weapon Systems Evaluations and Assessments	1	2017	4	2024
SMALL ARMS WEAPON SYSTEMS ENHANCEMENTS	1	2008	4	2024
Solid State Active Denial System	1	2020	4	2024
Current and Legacy Weapon Improvements	1	2020	4	2024
Individual Non-Lethal System	1	2020	4	2020
Non-Standard Weapon Assessments	1	2020	4	2024
Small Business Innovative Research	1	2015	4	2024
Protective Weapons Coatings (includes Adaptive Lubricious Coatings)	1	2016	4	2019
Weapons Upgrades and Accessories	1	2010	4	2019
AMMUNITION	1	2008	4	2023
Ammunition Upgrades	1	2016	4	2024
COMBAT OPTICS	1	2008	4	2024
Next Generation Optics	1	2020	4	2024
Optics Upgrades	1	2016	4	2019
FIRE CONTROL	1	2008	4	2024
Next Generation Fire Control Technology Enhancements	1	2019	4	2024
Next Generation Fire Control	1	2017	3	2019
Small Arms Fire Control Precision/Enhancements	1	2017	4	2019

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army			Date: March 2019		
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development		Project (Number/Name) S54 / Small Arms Improvement	
		Start		End	
Events		Quarter	Year	Quarter	Year
Small Arms Fire Control Upgrades		1	2008	4	2019
RESEARCH AND ANALYSIS		1	2012	4	2024
Research and Analysis of Small Arms		1	2015	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army										Date: March 2019		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) VS4 / Soldier Protective Equipment			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
VS4: Soldier Protective Equipment	-	29.934	21.126	2.836	-	2.836	4.444	4.909	6.488	8.150	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
Note This program supports the Cross Functional Team (CFT).												
A. Mission Description and Budget Item Justification This Project supports efforts to evaluate integrated technologies and representative or prototype systems that help expedite Personal Protective Equipment (PPE) technology transition from the laboratory to operational use.												
B. Accomplishments/Planned Programs (\$ in Millions)									FY 2018	FY 2019	FY 2020	
Title: Soldier Protective Equipment (SPE)									29.934	20.828	2.836	
Description: Effort to increase Warfighter lethality and mobility by optimizing Soldier protection while effectively managing all life cycle aspects of Personal Protective Equipment (PPE).												
FY 2019 Plans: Will continue Technology/Maturation and Risk Reduction efforts across the PPE portfolio to support the Soldier Protection System (SPS) requirements for lighter-weight ballistic materials with improved performance and manufacturing/testing process improvements. If ready, initiate proof-of-principle demonstrations on promising new and advanced materials, and in simulated and instrumented field exercises, evaluate upgrades and inform stakeholders of new operational capabilities. Continue efforts to characterize and increase durability, shelf life, and functional service life of existing personal protective systems at the subsystem/component level. Continue the development of improved measurement processes for existing systems and emerging requirements.												
FY 2020 Plans: Project, at a reduced level of effort from FY19, will continue Technology/Maturation and Risk Reduction efforts across the PPE portfolio: Torso and Extremity Protection (TEP); Vital Torso Protection (VTP); Integrated Head Protection System (IHPS); and Transition Combat Eye Protection (TCEP) to support SPS requirements for lighter-weight ballistic materials with improved performance and manufacturing/ testing process improvements. If new materials are ready, the Product Management Office will evaluate upgrades and inform stakeholders of new operational capabilities and then incorporate them into SPS designs as appropriate. Continue efforts to characterize and increase durability, shelf life, and functional service life of existing personal												

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army							Date: March 2019				
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development			Project (Number/Name) VS4 / Soldier Protective Equipment				
B. Accomplishments/Planned Programs (\$ in Millions) protective systems at the subsystem/component level. Continue the development of improved measurement processes for existing systems and emerging requirements. FY 2019 to FY 2020 Increase/Decrease Statement: Funding change in Soldier Protective Equipment portfolio is due to anticipated requirement changes in FY19 and FY20 that result in a reduced level of effort.							FY 2018	FY 2019	FY 2020		
Title: FY 2019 SBIR/STTR TRANSFER Description: FY 2019 SBIR/STTR TRANSFER FY 2019 Plans: FY 2019 SBIR/STTR TRANSFER FY 2019 to FY 2020 Increase/Decrease Statement: FY 2019 SBIR/STTR TRANSFER							-	0.298	-		
Accomplishments/Planned Programs Subtotals							29.934	21.126	2.836		
C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• VS5: Soldier Protective Equipment	1.725	6.050	6.627	-	6.627	8.327	9.666	9.490	8.507	0.000	50.392
Remarks											
D. Acquisition Strategy											
Programs pursue technology maturation and prototype development, culminating in the transition of mature technologies (Technology Readiness Levels (TRL) 6-7) to Engineering and Manufacturing Development. This Project continues to exercise competitively awarded contracts using best value source selection procedures where applicable.											
E. Performance Metrics											
N/A											

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army												Date: March 2019			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development				Project (Number/Name) VS4 / Soldier Protective Equipment					
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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 Support	Allot	PM SPIE Various : Various	1.350	0.862		0.934		0.400		-		0.400	Continuing	Continuing	Continuing
Subtotal			1.350	0.862		0.934		0.400		-		0.400	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	8.059	0.443		0.400		0.750		-		0.750	Continuing	Continuing	Continuing
Dev/Integ Contracts	TBD	Various : Various	33.363	26.805		18.219		1.000		-		1.000	Continuing	Continuing	Continuing
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.298		-		-		-	0.000	0.298	-
Subtotal			41.422	27.248		18.917		1.750		-		1.750	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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	3.925	0.832		0.662		0.200		-		0.200	Continuing	Continuing	Continuing
Subtotal			3.925	0.832		0.662		0.200		-		0.200	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
Ballistic/Blast/Nonballistic Testing	MIPR	Various : Various	16.790	0.992		0.613		0.486		-		0.486	Continuing	Continuing	Continuing
Subtotal			16.790	0.992		0.613		0.486		-		0.486	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army											Date: March 2019				
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / Soldier Systems - Advanced Development					Project (Number/Name) VS4 / Soldier Protective Equipment					
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			63.487	29.934		21.126		2.836		-		2.836	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army			Date: March 2019		
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>	

Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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
SPS Technology Upgrade Insertion																												
TCEP Authorized Protective Eyewear (APEL) Update																												
VTP LRIP Production																												
VTP RFP Submission																												
VTP FRP Decision																												
VTP Technology Upgrade Insertion																												
TEP Technology Upgrade Insertion																												
Helmet Technology Upgrade Insertion																												
VTP SSEB																												
Next Gen IHPS Contract Award																												
Next Gen IHPS Deliveries																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army			Date: March 2019
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
SPS Technology Upgrade Insertion	1	2017	4	2023
TCEP Authorized Protective Eyewear (APEL) Update	2	2019	2	2019
VTP LRIP Production	1	2017	1	2020
VTP RFP Submission	2	2018	2	2018
VTP FRP Decision	2	2019	2	2019
VTP Technology Upgrade Insertion	1	2020	4	2023
TEP Technology Upgrade Insertion	1	2020	4	2023
Helmet Technology Upgrade Insertion	1	2020	4	2023
VTP SSEB	3	2015	2	2019
Next Gen IHPS Contract Award	2	2019	2	2019
Next Gen IHPS Deliveries	2	2021	4	2023