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Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Army **Date:** February 2020

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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
Total Program Element	-	30.384	26.113	26.138	-	26.138	30.945	33.961	28.535	32.332	Continuing	Continuing
CF2: <i>Integrated Soldier Systems Prototyping (SL CFT)</i>	-	0.000	1.959	2.541	-	2.541	3.149	3.771	3.843	3.881	0.000	19.144
ET8: <i>Personnel Airdrop System Development</i>	-	0.396	0.297	1.266	-	1.266	1.264	1.811	0.999	0.999	Continuing	Continuing
S53: <i>Clothing And Equipment</i>	-	1.765	6.466	1.808	-	1.808	2.414	4.474	5.073	8.726	Continuing	Continuing
S54: <i>Small Arms Improvement</i>	-	7.395	14.555	16.082	-	16.082	19.213	17.423	10.477	10.583	0.000	95.728
VS4: <i>Soldier Protective Equipment</i>	-	20.828	2.836	4.441	-	4.441	4.905	6.482	8.143	8.143	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 FY 2050. The ASA will develop a metric-based approach that will include live, virtual and constructive evaluations and tools across the Department of Defense (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 and safety of the airborne Soldier and increasing the performance, reliability, 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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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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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 Budget Activity (BA) 3 Program Element 0603607A Joint Service Small Arms Program (JSSAP) Project 627 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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	31.022	22.113	26.161	-	26.161
Current President's Budget	30.384	26.113	26.138	-	26.138
Total Adjustments	-0.638	4.000	-0.023	-	-0.023
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	4.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.638	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.023	-	-0.023

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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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Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: S53: *Clothing And Equipment*

Congressional Add: *Cold Weather Clothing*

	FY 2019	FY 2020
	-	4.000
Congressional Add Subtotals for Project: S53	-	4.000
Congressional Add Totals for all Projects	-	4.000

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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) CF2 / <i>Integrated Soldier Systems Prototyping (SL CFT)</i>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
CF2: <i>Integrated Soldier Systems Prototyping (SL CFT)</i>	-	0.000	1.959	2.541	-	2.541	3.149	3.771	3.843	3.881	0.000	19.144
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Verify and maintain tools that provide Systems Engineering, Configuration Management, and Evaluations in a virtual and physical environment. Verify and maintain the Adaptive Squad Architecture (ASA) and Squad Performance Model (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. Funding for this project aligns with the Army's priorities in support of the National Defense Strategy and is a priority of the Soldier Lethality Cross Functional Team. FY 2020 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 2019	FY 2020	FY 2021
Title: Integrated Soldier Systems Prototyping	-	1.870	2.541
<p>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. Funding for this project aligns with the Army's priorities in support of the National Defense Strategy and is a priority of the Soldier Lethality Cross Functional Team</p> <p>FY 2020 Plans: FY 2020 Plans: Finalize operational version of ASA and SPM</p> <p>FY 2021 Plans: Accelerate the development of components, algorithms, and demonstrations in support of Squad as an Integrated Combat Platform</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement:</p>			

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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) CF2 / <i>Integrated Soldier Systems Prototyping (SL CFT)</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
FY 2020 to FY 2021 increase in required funding due to increased trade-off analysis of technology integration with Soldiers' personal protection, electronics connectivity, power and energy, user interfaces, and display content.			
Title: FY 2020 SBIR/STTR Transfer	-	0.089	-
Description: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 Plans: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	-	1.959	2.541

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• CF3: <i>Integrated Soldier Systems (SL CFT)</i>	-	4.504	4.597	-	4.597	4.425	4.498	4.580	4.626	0.000	27.230

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army												Date: February 2020			
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)							
Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.089		-		-		-	0.000	0.089	-
Subtotal			-	-		0.089		-		-		-	0.000	0.089	N/A
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	-	-		0.455	Jan 2020	0.500	Jan 2021	-		0.500	Continuing	Continuing	Continuing
Subtotal			-	-		0.455		0.500		-		0.500	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	-	-		1.415		2.041	Dec 2020	-		2.041	Continuing	Continuing	Continuing
Subtotal			-	-		1.415		2.041		-		2.041	Continuing	Continuing	N/A
Project Cost Totals			-	-		1.959		2.541		-		2.541	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army			Date: February 2020
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) CF2 / <i>Integrated Soldier Systems Prototyping (SL CFT)</i>	

Event Name	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
ASA SPM Implementation																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) CF2 / <i>Integrated Soldier Systems Prototyping (SL CFT)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ASA SPM Implementation	2	2020	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
ET8: <i>Personnel Airdrop System Development</i>	-	0.396	0.297	1.266	-	1.266	1.264	1.811	0.999	0.999	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding in this project supports the Army's Cross Functional Teams (CFT) initiatives. 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 and safety of the airborne Soldier and increasing the performance, reliability, and durability of personnel airdrop equipment. This project will transition capabilities from our Science and Technology partners to increase performance and safety of Soldier clothing and equipment. It will continue to support cross-service initiatives to improve commonality.

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

	FY 2019	FY 2020	FY 2021
Title: Personnel Airdrop System Development	0.396	0.283	1.266
Description: 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 and safety of the airborne soldier and increasing the performance, reliability, and durability of personnel airdrop equipment.			
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 2021 Plans: Continue evaluation of Low Altitude Static Line Automatic Activation Devices (now called T11 RAAD or T11 Reserve Automatic Activation Device (T-11R AAD)) and begin evaluation of Smart Universal Static Line Snap Hook (SUSH).			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding increase in Personnel Airdrop System Development portfolio is due to the continued development of the T-11 Reserve Automatic Activation Device (T-11R AAD) and the initial evaluation of the Smart Universal Static Line Snap Hook (SUSH) technology.			
Title: FY 2020 SBIR/STTR Transfer	-	0.014	-
Description: Funding transferred in accordance with Title 15 USC ?638			
FY 2020 Plans:			

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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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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
Funding transferred in accordance with Title 15 USC ?638			
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i>			
Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	0.396	0.297	1.266

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u> <u>Base</u>	<u>FY 2021</u> <u>OCO</u>	<u>FY 2021</u> <u>Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• ES9: <i>Advanced Tactical Parachute System</i>	6.457	6.617	1.827	-	1.827	2.962	2.961	2.997	3.996	0.000	27.817
• MA7801: <i>Advanced Tactical Parachute System</i>	41.104	42.622	53.021	-	53.021	47.755	39.808	38.978	25.110	0.000	288.398

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).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army												Date: February 2020			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603827A / Soldier Systems - Advanced Development				ET8 / Personnel Airdrop System Development							
Management Services (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
FY 2020 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.014		-		-		-	0.000	0.014	-
Subtotal			-	-		0.014		-		-		-	0.000	0.014	N/A
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	-	-		0.093		0.727		-		0.727	2.588	3.408	-
Engineering Support	MIPR	CCDC Natick, MA : various	0.460	0.096		0.096		0.100		-		0.100	0.827	1.579	-
Subtotal			0.460	0.096		0.189		0.827		-		0.827	3.415	4.987	N/A
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	0.245	0.100		0.094		0.100		-		0.100	0.811	1.350	-
Subtotal			0.245	0.100		0.094		0.100		-		0.100	0.811	1.350	N/A
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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
Test and Evaluation	MIPR	TBD : TBD	0.435	0.200		-		0.339		-		0.339	0.782	1.756	-
Subtotal			0.435	0.200		-		0.339		-		0.339	0.782	1.756	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army								Date: February 2020			
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>				
	Prior Years	FY 2019	FY 2020		FY 2021 Base	FY 2021 OCO	FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	1.140	0.396	0.297		1.266	-	1.266	5.008	8.107	N/A	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
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 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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
Low Observable (Signature Reduction) Testing	█																											
Evaluate Component and Subsystem Technologies	█				█				█				█				█											
Static Line T-11 RAAD Development					█				█																			
Develop T-11 Light Weight Canopy													█				█											
Develop Smart Universal Static line Hook (SUSH)									█				█															
High Altitude Insertion Enhancements													█				█				█							

Note
High Altitude Insertion Enhancements includes the following: Glide Augmentation, Situational Awareness Aids, GPS Denied Navigation Aid and High Altitude Combo Drops.

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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Low Observable (Signature Reduction) Testing	1	2019	4	2019
Evaluate Component and Subsystem Technologies	1	2019	4	2023
Static Line T-11 RAAD Development	3	2020	4	2021
Develop T-11 Light Weight Canopy	1	2022	4	2023
Develop Smart Universal Static line Hook (SUSH)	3	2021	4	2022
High Altitude Insertion Enhancements	1	2022	4	2025

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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>			
COST (\$ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
S53: <i>Clothing And Equipment</i>	-	1.765	6.466	1.808	-	1.808	2.414	4.474	5.073	8.726	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding in this project supports the Army's Cross Functional Teams (CFT) initiatives. 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 a broad spectrum of users 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 all environments such as 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. This project will transition capabilities from our Science and Technology partners to increase performance and safety of Soldier clothing and equipment. It will continue to support cross-service initiatives to increase commonality.

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

	FY 2019	FY 2020	FY 2021
Title: Soldier Uniforms and Clothing	1.765	0.472	1.419
Description: Develop superior and sustainable integrated clothing for the Soldier in a rapidly changing global environment.			
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 2021 Plans: Continue Flame Resistant clothing upgrades. Analyze Flame Resistant garment upgrades and review/improve testing protocols. Continue Signature Management efforts in Camouflage Flame Resistant clothing and equipment. Develop enhanced OCIE capabilities for Soldiers operating in cold and extreme cold environments. Continue testing novel materials and processes to improve clothing and equipment for extreme climates. Improve size standardization for all individually sized items.			
FY 2020 to FY 2021 Increase/Decrease Statement:			

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

	FY 2019	FY 2020	FY 2021
FY20 \$4M Congressional Add for Cold Weather Clothing. Funding increase between FY 2020 and FY 2021 due to anticipated requirements changes.			
Title: Individual Equipment	-	1.994	0.389
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. Develop and evaluate hydration devices items like cold weather canteens, individual water treatment devices, and multi purpose hydration systems.			
FY 2021 Plans: Analyze Flame Resistant garment upgrades and review/improve testing protocols. Begin development of a Toxic Industrial Chemicals/Toxic Industrial Materials (TIC/TIM) filtration capability for the Individual Water Treatment Device (IWTD). Evaluate current load carriage equipment to asses its ability to support the modernization of current individual weapons and situational awareness capabilities. Optimize the capability of Load Carriage items to support modernization for weapons and tactical gear.			
FY 2020 to FY 2021 Increase/Decrease Statement: Funding decrease from FY 2020 to FY 2021 due to anticipated changes in requirements.			
Accomplishments/Planned Programs Subtotals	1.765	2.466	1.808

	FY 2019	FY 2020
Congressional Add: Cold Weather Clothing	-	4.000
FY 2020 Plans: Cold Weather Clothing		
Congressional Adds Subtotals	-	4.000

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	
• S60: <i>Clothing & Equipment</i>	8.152	6.453	6.717	-	6.717	5.010	4.846	3.697	6.814	0.000	41.689

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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>

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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army												Date: February 2020				
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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	15.495	0.285		0.296		0.290		-		0.290	Continuing	Continuing	Continuing	
Subtotal			15.495	0.285		0.296		0.290		-		0.290	Continuing	Continuing	N/A	
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	16.338	0.327		1.441		0.347		-		0.347	Continuing	Continuing	Continuing	
Development Contracts	C/FFP	Various : Various	34.449	0.355		2.588		0.374		-		0.374	Continuing	Continuing	Continuing	
FY 2019 SBIR /STTR Transfer/FFRDC	TBD	TBD : TBD	-	0.060		-		-		-		-	0.000	0.060	-	
Subtotal			50.787	0.742		4.029		0.721		-		0.721	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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 Office Support Costs	MIPR	Natick, MA : Natick, MA	8.402	0.302		0.296		0.322		-		0.322	Continuing	Continuing	Continuing	
Subtotal			8.402	0.302		0.296		0.322		-		0.322	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	26.914	0.436		1.845		0.475		-		0.475	Continuing	Continuing	Continuing	
Subtotal			26.914	0.436		1.845		0.475		-		0.475	Continuing	Continuing	N/A	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army								Date: February 2020					
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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	101.598	1.765		6.466		1.808		-		1.808	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
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 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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																												
Flame Resistant Clothing Upgrades																												
Improve Signature Mgmt (IR) Eval & Camo in Clothing & Eqpt																												
CW/ECW Clothing Improvements																												
CW/ECW Handwear																												
INDIVIDUAL EQUIPMENT																												
Multi-purpose Personal Hydration System (MPHS) Shelf-life Ext																												
Develop TIC/TIM Capability for the Individual Water Treatment Device (IWTB)																												
Develop Cold Weather Canteen																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
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	2025
Flame Resistant Clothing Upgrades	1	2012	4	2023
Improve Signature Mgmt (IR) Eval & Camo in Clothing & Eqpt	2	2012	4	2024
CW/ECW Clothing Improvements	1	2019	4	2022
CW/ECW Handwear	1	2020	4	2020
INDIVIDUAL EQUIPMENT	4	2015	4	2025
Multi-purpose Personal Hydration System (MPHS) Shelf-life Extension Eval	1	2019	4	2024
Develop TIC/TIM Capability for the Individual Water Treatment Device (IWTD)	1	2022	4	2022
Develop Cold Weather Canteen	1	2020	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
S54: <i>Small Arms Improvement</i>	-	7.395	14.555	16.082	-	16.082	19.213	17.423	10.477	10.583	0.000	95.728
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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 Budget Activity (BA) 3 Program Element (PE) 0603607A Joint Service Small Arms Program (JSSAP) Project 627 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 2019	FY 2020	FY 2021
Title: New Weapon Systems	0.800	2.505	2.590
Description: Development of new small arms weapon systems.			
FY 2020 Plans: Externally Powered Weapon (EPW): Continued to support the development of the Capability Development Document (CDD) with Maneuver Center of Excellence and Maneuver Support Center of Excellence. Intended to leverage information gathered from prototype testing and developed a demonstrator to better evaluate and inform the CDD and the various platforms that may include the EPW as their Armament System. Initiated 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.			
New Weapon Systems Evaluations and Assessments: Continued to perform initial evaluation and assessment of new weapon systems.			
FY 2021 Plans: Next Generation Weapons will begin to support technology development for future Next Generation Weapon variants addressing operational force needs for increased lethality, increased probability of hit, increased soldier acceptance, decreased signature,			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020		
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 2019	FY 2020	FY 2021
<p>reduced recoil, reduced soldier aim error, and reduced engagement time. New weapons may be variants or enhancements of the NGSW-R and NGSW-AR or new weapon platforms to fulfill other roles such as machine guns, sniper rifles, and others.</p> <p>EPW will complete maturation and upgrade of prototype system based on test and experimentation results. Will continue with integration of intelligence/networking/remote operation capabilities. Will continue to work with Maneuver and Maneuver Support Capabilities Development and Integration Directorate (M-CDID and MS-CDID) Futures and Concepts Centers regarding the Capability Development Document.</p> <p>New Weapons Systems Evaluations and Assessments: Will continue to perform initial and follow-on evaluations, assessments and integration of new weapons to include various new weapon system platforms.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Increase in funding required for development and testing of New Weapon Systems.</p>				
<p>Title: Small Arms Weapon Systems Enhancements</p> <p>Description: Enhancements and development of small arms weapon systems.</p> <p>FY 2020 Plans: Current and Legacy Weapon Improvements assessed and evaluated selected capabilities and improvements for all current and legacy weapon systems.</p> <p>Solid State Active Denial System worked to complete maturation of design, continued to monitor status of Capability Development Document and provided input into programmatic documents as necessary.</p> <p>Individual Non-Lethal System worked to complete maturation of design and got it ready for prove out test at Government facility in support of Milestone B. Previously funded in Fiscal Year (FY) 2017.</p> <p>Non-Standard Weapons Assessments continued to conduct baseline testing of commercial weapon systems and perform capability analysis of unique weapon characteristics. Continued to utilize test information to conduct trade off assessments of Non-Developmental Item solutions for pending requirements as well as established safety parameters for the training mission of Regionally Aligned Forces and established a sustainment strategy for long term support of weapons procured to support the Regionally Aligned Forces training mission. Continued to conduct market research of commercially available weapon systems.</p>		1.340	7.650	8.645

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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 2019	FY 2020	FY 2021
<p>Small Business Innovative Research Enhancements continued future efforts to focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, training effectiveness and reliability of weapons.</p> <p>FY 2021 Plans: Next Generation Defeat will design, develop, and prototype fabrication of advanced technologies to incorporate into Soldier employable system that will be capable of on-target effects against multiple types of targets (i.e. targets behind cover, targets that are exposed, thin skin vehicles, unmanned aerial systems)</p> <p>Next Generation Weapons/Enhancements will begin to support technology development for future Next Generation Weapon variants addressing operational force needs for increased lethality, increased probability of hit, increased soldier acceptance, decreased signature, reduced recoil, reduced soldier aim error, and reduced engagement time. New weapons may be variants or enhancements of the Next Generation Squad Weapon Rifle (NGSW-R) and Next Generation Squad Automatic Rifle (NGSAR) or new weapon platforms to fulfill other roles such as machine guns, sniper rifles, and others.</p> <p>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 other non Department of Defense (DOD) customers. Will continue to establish a sustainment strategy for long term support of weapons procured to support the Regionally Aligned Forces training mission. Will conduct safety assessments of limited distribution materiel systems considered for Table of Organization and Equipment (TOE) and Common Table of Allowances (CTA) approvals. Continue to conduct market research of commercially available weapon systems.</p> <p>Protective Weapons Coatings/Low Plasticity Burnishing will continue to develop manufacturing technology to support production of super hydrophobic and other coatings in support of preserving barrel and bolt life of small arms weapons while improving readiness. Continue to assess and evaluate current manufacturing process studies and assessments to adapt the coating technology into weapon Original Equipment Manufacturer manufacturing processes.</p> <p>Solid State Active Denial System will continue to monitor status of Capability Development Document and provide input into other programmatic documents as necessary. Will continue work to complete maturation of design.</p> <p>Individual Non-Lethal System will mature and complete prototype design for integration into a full system. Will prepare for proof of concept and design test efforts at Government facility in support of Milestone B. New Start in FY 2020.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020		
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 2019	FY 2020	FY 2021
<p>Armaments for Robots will continue 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>Recoil Reduction Mechanisms will continue to assess and evaluate selected Recoil Reduction Mechanisms prototypes to be fabricated and tested for both individual and crew served weapons.</p> <p>Current and Legacy Weapon Improvements will continue to assess and evaluate selected capabilities and improvements for all current and legacy weapon systems.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Increase in funds required to reduce technology risk and to determine the appropriate set of technologies required to complete Next Generation Weapons technology development phase.</p>				
<p>Title: Ammunition</p> <p>Description: Small arms ammunition improvement.</p> <p>FY 2020 Plans: Ammunition Upgrades: Continued to evaluate the effect of new ammunition on small arms weapon systems.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Decrease in funding due to a lack of Ammo requirements.</p>		0.130	0.100	-
<p>Title: Combat Optics</p> <p>Description: Improvement of small arms combat optics.</p> <p>FY 2020 Plans: FY 2020 New Start: Next Generation Optics: Integrated current and emerging target acquisition component technologies into a variable magnification spotting scope and into binoculars.</p> <p>FY 2021 Plans: Next Generation Optics: Will continue to integrate current and emerging target acquisition component technologies into binoculars and variable magnification spotting scopes. Will continue to evaluate state of the art advances in optical component technologies for inclusion in future combat optic products.</p>		0.137	0.100	0.100
<p>Title: Fire Control</p> <p>Description: Small arms fire control.</p>		4.721	4.000	4.000

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020		
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 2019	FY 2020	FY 2021
<p>FY 2020 Plans: Next Generation Fire Control Technology Enhancements continued 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 had application in individual and crew served weapons to enhance and upgrade Fire Control.</p> <p>FY 2021 Plans: Next Generation Fire Control Technology Enhancements will continue to support technology integration with Next Generation Weapons addressing soldier aim error, engagement time, probability of hit, situational awareness, lethality, and soldier acceptance. Iterative prototyping will be utilized to develop component technologies to support future variants of the Next Generation Squad Weapon. Technology may include enhanced camera based technology, target tracking, automatic target detection, increased networked lethality, reduced signature, increased user acceptance, along with other emerging weapon, ammunition, and fire control technologies that will increase the lethality of the next generation squad weapons.</p> <p>Small Arms Fire Control Enhancements will continue research test and evaluation efforts on laser based wind sensors, proof-of-concept devices, and other optical designs for prototypes that incorporate fire control sensors and ballistic solver software and integration of sensor input and communication with ammunition for all small arms weapon platforms.</p>				
<p>Title: Research and Analysis</p> <p>Description: Research and analysis of small arms.</p> <p>FY 2020 Plans: Continued 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 2021 Plans: Plan to continue Market Research and Benefit Analysis of 360 degree situational awareness, active stabilization, advanced kinetic weapons, low flying drone engagement, and other small arms research to include new technologies in emerging robotic and aerial armaments.</p> <p>FY 2020 to FY 2021 Increase/Decrease Statement: Increase in funds required to explore emerging technologies in robotic and aerial armaments.</p>		0.267	0.200	0.747
Accomplishments/Planned Programs Subtotals		7.395	14.555	16.082

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army		Date: February 2020
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)

Line Item	FY 2019	FY 2020	FY 2021	FY 2021	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	Cost To	Total Cost
			Base	OCO	Total					Complete	
• EW4: <i>Crew Served Weapons Engineering Development</i>	25.058	4.089	4.263	-	4.263	4.285	4.423	4.525	4.498	0.000	51.141
• FF2: <i>Small Arms Fire Control</i>	4.094	14.700	10.153	-	10.153	11.244	7.993	9.991	9.992	0.000	68.167
• FI2: <i>Lightweight 30mm Cannon</i>	-	1.384	0.000	-	0.000	-	-	-	-	0.000	1.384
• FM4: <i>Next Generation Squad Weapons</i>	-	33.080	44.837	-	44.837	13.767	15.456	16.045	10.991	0.000	134.176
• S63: <i>Individual Weapons Engineering Development</i>	12.454	2.697	4.374	-	4.374	4.214	4.280	4.270	4.216	0.000	36.505
• FL4: <i>Small Caliber Ammo for Next Gen Squad Weapons</i>	-	18.180	30.600	-	30.600	28.723	24.976	11.739	11.858	0.000	126.076
• 627: <i>Jt Svc Sa Prog (JSSAP)</i>	5.708	-	0.000	-	0.000	-	-	-	-	0.000	5.708
• E06002: <i>NEXT GENERATION COMBAT ROUND</i>	-	-	11.988	-	11.988	20.519	60.880	187.813	189.692	0.000	470.892

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 modernizing, enhancing and/or improving the small arms inventory.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army												Date: February 2020			
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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	6.904	0.582	Mar 2019	0.590	Mar 2020	0.560	Mar 2021	-		0.560	Continuing	Continuing	Continuing
FY2019 SBIR / STTR Transfer	FFRDC	Army Budget Office : Pentagon, Washington DC	-	0.282	Nov 2018	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			6.904	0.864		0.590		0.560		-		0.560	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	33.723	3.680	Mar 2019	9.755	Mar 2020	10.505	Mar 2021	-		10.505	Continuing	Continuing	Continuing
Subtotal			33.723	3.680		9.755		10.505		-		10.505	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	27.051	1.162	Mar 2019	2.240	Mar 2020	2.240	Mar 2021	-		2.240	Continuing	Continuing	Continuing
Subtotal			27.051	1.162		2.240		2.240		-		2.240	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army												Date: February 2020			
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>							
Test and Evaluation (\$ in Millions)															
				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	15.008	1.689	Mar 2019	1.970	Mar 2020	2.777	Mar 2021	-		2.777	Continuing	Continuing	Continuing
Subtotal			15.008	1.689		1.970		2.777		-		2.777	Continuing	Continuing	N/A
			Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			82.686	7.395		14.555		16.082		-		16.082	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army			Date: February 2020
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>	

Event Name	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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 Automatic-Rifle																												
Next Generation Squad Weapon-Rifle																												
Externally Powered Weapon (EPW)																												
New Weapon Systems Evaluations and Assessments																												
SMALL ARMS WEAPON SYSTEMS ENHANCEMENTS																												
Next Generation Defeat																												
Current and Legacy Weapon Improvements																												
Individual Non-Lethal System																												
Non-Standard Weapon Assessments																												
Small Business Innovative Research																												
Protective Weapons Coatings (Low Plasticity Burnishing)																												
Weapons Upgrades and Accessories																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
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>

Event Name	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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 Enhancements																												
Formerly 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 2021 Army		Date: February 2020
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	2025
Next Generation Automatic-Rifle	1	2014	4	2020
Next Generation Squad Weapon-Rifle	2	2019	4	2020
Externally Powered Weapon (EPW)	1	2015	4	2022
New Weapon Systems Evaluations and Assessments	1	2017	4	2025
SMALL ARMS WEAPON SYSTEMS ENHANCEMENTS	1	2008	4	2025
Next Generation Defeat	1	2021	4	2023
Current and Legacy Weapon Improvements	1	2020	4	2025
Individual Non-Lethal System	1	2021	4	2022
Non-Standard Weapon Assessments	1	2020	4	2025
Small Business Innovative Research	1	2015	4	2025
Protective Weapons Coatings (Low Plasticity Burnishing)	1	2016	4	2022
Weapons Upgrades and Accessories	1	2010	4	2025
AMMUNITION	1	2008	4	2020
Ammunition Upgrades	1	2016	4	2020
COMBAT OPTICS	1	2008	4	2025
Next Generation Optics	1	2020	4	2024
Optics Upgrades	1	2016	4	2019
FIRE CONTROL	1	2008	4	2025
Next Generation Fire Control Technology Enhancements	1	2019	4	2025
Next Generation Fire Control	1	2017	3	2019
Small Arms Fire Control Enhancements	1	2017	4	2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army			Date: February 2020	
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>		

Events	Start		End	
	Quarter	Year	Quarter	Year
Small Arms Fire Control Upgrades	1	2008	4	2019
RESEARCH AND ANALYSIS	1	2012	4	2025
Research and Analysis of Small Arms	1	2015	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army										Date: February 2020		
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 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
VS4: <i>Soldier Protective Equipment</i>	-	20.828	2.836	4.441	-	4.441	4.905	6.482	8.143	8.143	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Funding in this project supports the Army's Cross Functional Teams' (CFT) initiatives. 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. This project will transition capabilities from our Science and Technology partners to increase performance and safety of Soldier clothing and protective equipment. It will continue to support cross-service initiatives to increase commonality.

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

	FY 2019	FY 2020	FY 2021
Title: Soldier Protective Equipment (SPE)	20.828	2.836	4.441
Description: Effort to increase Warfighter survivability and mobility by optimizing Soldier protection while effectively managing all life cycle aspects of Personal Protective Equipment (PPE).			
FY 2020 Plans: This project executing 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. As 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 protective systems at the subsystem/component level. Continue the development of improved measurement processes for existing systems and emerging requirements.			
FY 2021 Plans: Project 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 Military Combat Eye Protection (MCEP) 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			

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Exhibit R-2A, RDT&E Project Justification: PB 2021 Army	Date: February 2020
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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) VS4 / <i>Soldier Protective Equipment</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2019	FY 2020	FY 2021
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.			
<i>FY 2020 to FY 2021 Increase/Decrease Statement:</i> Funding change in Soldier Protective Equipment portfolio is due to anticipated requirement changes in FY 2020 and FY 2021 that result in a increase level of effort to address emerging threats.			
Accomplishments/Planned Programs Subtotals	20.828	2.836	4.441

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• VS5: <i>Soldier Protective Equipment</i>	4.667	6.627	8.319	-	8.319	9.656	9.480	8.498	9.063	0.000	56.310
• 121017: <i>Central Issue</i>	-	-	-	-	-	-	-	-	-		
<i>Facilities/Initial Issue:</i>											
<i>Organization/Clothing/Equipment</i>											

Remarks

D. Acquisition Strategy
Programs pursue technology transition from science and 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.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Army												Date: February 2020				
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 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	2.212	0.934		0.400		0.782		-		0.782	Continuing	Continuing	Continuing	
Subtotal			2.212	0.934		0.400		0.782		-		0.782	Continuing	Continuing	N/A	
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	8.502	0.400		0.750		0.500		-		0.500	Continuing	Continuing	Continuing	
Dev/Integ Contracts	TBD	Various : Various	60.168	17.609		1.000		2.509		-		2.509	Continuing	Continuing	Continuing	
FY 2019 FFRDC / SBIR / STTR	TBD	TBD : TBD	-	0.308		-		-		-		-	0.000	0.308	-	
Subtotal			68.670	18.317		1.750		3.009		-		3.009	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	4.757	0.664		0.200		-		-		-	Continuing	Continuing	Continuing	
Subtotal			4.757	0.664		0.200		-		-		-	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 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	17.782	0.913		0.486		0.650		-		0.650	Continuing	Continuing	Continuing	
Subtotal			17.782	0.913		0.486		0.650		-		0.650	Continuing	Continuing	N/A	

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Exhibit R-4, RDT&E Schedule Profile: PB 2021 Army		Date: February 2020
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 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025			
	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	[Blue bar spanning FY 2019 Q1 to FY 2023 Q4]																											
TCEP Authorized Protective Eyewear (APEL) Update	▲ 1	[Greyed out]																										
VTP LRIP Production	[Blue bar spanning FY 2019 Q1 to FY 2021 Q2]																											
VTP FRP Decision	[Greyed out]																											
VTP Technology Upgrade Insertion	[Blue bar spanning FY 2020 Q1 to FY 2023 Q4]																											
TEP Technology Upgrade Insertion	[Blue bar spanning FY 2020 Q1 to FY 2023 Q4]																											
Helmet Technology Upgrade Insertion	[Blue bar spanning FY 2020 Q1 to FY 2022 Q3]																											
Next Gen IHPS Contract Award	[Greyed out]																											
Next Gen IHPS Deliveries	[Blue bar spanning FY 2021 Q3 to FY 2025 Q4]																											
MCEP Improvement	[Blue bar spanning FY 2021 Q1 to FY 2022 Q4]																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2021 Army		Date: February 2020
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	3	2019	3	2019
VTP LRIP Production	1	2017	1	2021
VTP FRP Decision	1	2020	1	2020
VTP Technology Upgrade Insertion	1	2020	4	2023
TEP Technology Upgrade Insertion	1	2020	4	2023
Helmet Technology Upgrade Insertion	1	2020	4	2021
Next Gen IHPS Contract Award	1	2021	1	2021
Next Gen IHPS Deliveries	4	2021	4	2025
MCEP Improvement	1	2021	4	2022