Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army											Date: May 2017	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 2: *Applied Research*					R-1 Program Element (Number/Name) PE 0602623A *I Joint Service Small Arms Program*							
COST ($ in Millions)	**Prior Years**	**FY 2016**	**FY 2017**	**FY 2018 Base**	**FY 2018 OCO**	**FY 2018 Total**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**Cost To Complete**	**Total Cost**
Total Program Element	-	5.270	5.545	5.615	-	5.615	5.576	5.687	5.801	5.919	-	-
H21: *Jt Svc Sa Prog (JSSAP)*	-	5.270	5.545	5.615	-	5.615	5.576	5.687	5.801	5.919	-	-

A. Mission Description and Budget Item Justification

This Program Element (PE) investigates individual and crew-served weapon designs and technologies that enhance the fighting capabilities and survivability of the dismounted Warfighter in support of all of the Services. All work is led by the Joint Service Small Arms Program (JSSAP) and is based upon the Joint Service Small Arms Master Plan (JSSAMP) and the Joint Capabilities Integration Development System's Small Arms Analyses.

Work in this PE is related to, and fully coordinated with, efforts in PE 0601102A (Defense Research Sciences), PE 0602624A (Weapons and Munitions Technology), PE 0603607A (Joint Service Small Arms Program), and PE 0602618A (Ballistic Technology).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy.

This program is managed by the Army Armament Research, Development, and Engineering Center (ARDEC), Picatinny Arsenal, NJ, in collaboration with the Army Research Laboratory (ARL) at Aberdeen Proving Ground, MD.

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	5.487	5.545	5.608	-	5.608
Current President's Budget	5.270	5.545	5.615	-	5.615
Total Adjustments	-0.217	0.000	0.007	-	0.007
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.217	-			
• Civ Pay Adjustments	0.000	0.000	0.007	-	0.007

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017
Appropriation/Budget Activity 2040 / 2	R-1 Program Element (Number/Name) PE 0602623A / *Joint Service Small Arms Program*	Project (Number/Name) H21 / *Jt Svc Sa Prog (JSSAP)*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
H21: *Jt Svc Sa Prog (JSSAP)*	-	5.270	5.545	5.615	-	5.615	5.576	5.687	5.801	5.919	-	-

A. Mission Description and Budget Item Justification

This Project investigates individual and crew-served weapon component design and technologies that enable increased lethality for survivability of the dismounted Warfighter in all the Services. All efforts are based upon the Joint Service Small Arms Master Plan (JSSAMP) and the Joint Capabilities Integration Development System's Small Arms Analyses.

Efforts in this Project support the Lethality portfolio.

Work in this Project is related to, and fully coordinated with, efforts in Program Element (PE) 0602624A (Weapons and Munitions Technology) and PE 0603607A (Joint Service Small Arms Program) and PE 0602786A (Warfighter Technology).

The cited work is consistent with the Assistant Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

Work in this Project is performed by the Army Armament Research, Development, and Engineering Center (ARDEC), Picatinny, NJ.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: Weapon System and Enablers	1.683	1.860	1.881
Description: This effort investigates and evaluates small arm weapon systems and enabling technologies to include: weapon size, weight and power consumption, barrel properties, recoil force, balance, and suitability. This effort also investigates scalable effects weapons in order to increase warfighter capability by providing one cartridge/weapon system delivering variable effects from non-lethal to lethal at greater ranges than currently available.			
FY 2016 Accomplishments: Investigated and evaluated advanced materials, coatings and weapon system designs in order to reduce weight, mitigate recoil, and decrease weapon signature; matured suppressor designs to reduce gun flash and acoustic signatures; investigated futuristic small arms weapon systems proposed by the West Point Futures Study and generated technology plans, trade-off analyses, and concept gun designs.			
FY 2017 Plans:			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602623A / *Joint Service Small Arms Program*	**Project (Number/Name)** H21 / *Jt Svc Sa Prog (JSSAP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Investigate and assess technologies to improve the accuracy and controllability of the weapon with the Soldier-in-the loop, and facilitate the operation of the weapon system with novel or advanced ammunition concepts required to meet lethality requirements. ***FY 2018 Plans:*** Will design and develop active stabilization technologies to increase hit probabilities and advance next generation fire control technologies; investigate high pressure weapon operation cycling for increase ammunition terminal performance and increase speed to target engagements; mature precision munitions components to increase probability of incapacitation against near and far term enemy threats; develop new techniques for evaluating and improving the reliability of weapon systems with the end goal of increasing the Mean Rounds Between Failure (MRBF) and Mean Rounds Between Stoppages (MRBS); and investigate technologies to increase weapon reliability/durability through use of advance coatings which will reduce or eliminate the need for conventional lubricants in weapon action components; design and develop a small arms barrel characterization tool to determine optimal weapon thermal loading, heat input, bore stresses, and chemical, thermal, mechanical erosion.			
Title: Small Arms Ammunition Research ***Description:*** This effort addresses the design and evaluation of ammunition with reduced weight, signature, fouling and contaminants as well as improved terminal performance and improved performance against soft and hard targets. ***FY 2016 Accomplishments:*** Investigated and evaluated ammunition designs in order to increase probability of hit and probability of incapacitation/hit; optimized caliber and configuration to defeat personnel targets at extended ranges, with or without protection; conducted trade studies to support energetic materials for propulsion, breaching ammo and tagging and marking; designed, fabricated and evaluated advanced armor piercing 5.56 mm and advanced kinetic energy ammunition in collaboration with ARL. ***FY 2017 Plans:*** Investigate and assess ammunition propulsion technologies to increase muzzle velocity that meet safety constraints (noise and muzzle pressure) yet increase velocity/muzzle energies like launch mechanisms (sabot, taper bore, etc); improve propellant higher energy densities; introduce compact cartridges; and lighten cartridge weight; improve ammunition projectiles to reduce energies required to perforate toughest targets and implement highly efficient aerodynamics. ***FY 2018 Plans:*** Will design and develop ammunition technologies to support precision ammunition requirements for extended range, accuracy and terminal effects required to perforate toughest targets and implement highly efficient aerodynamics. These technologies will support the development of next generation small arms ammunition.	1.218	3.046	3.079
Title: Optics and Fire Control	1.768	-	-

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Appropriation/Budget Activity 2040 / 2	**R-1 Program Element (Number/Name)** PE 0602623A / *Joint Service Small Arms Program*	**Project (Number/Name)** H21 / *Jt Svc Sa Prog (JSSAP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Description: This effort investigates and evaluates optics and fire control technologies in order to provide a single ballistic solution to the Warfighter. Fire control devices include a laser range finder to determine the range of a target, a ballistic sensor to detect the position of the weapon system, and sensors that can measure local and downrange conditions that would affect the trajectory of a round. ***FY 2016 Accomplishments:*** Investigated and evaluated hardware and software component technologies for an enhanced ballistic computer that enables fire on the move trajectory correction and increased precision at longer ranges, wind and improved environmental sensing, and improved target identification.			
Title: Small Arms Technology Applied Research ***Description:*** This effort supports the requirements analysis and the long-term investigation and maturation of technologies to fulfill the Department of Defense small arms capability requirements. The Joint Service Small Arms Program continuously utilizes studies and evaluations to determine the feasibility of novel material concepts; investigate all potential interfaces between the Soldier, training, weapon, optics, and the ammunition; and explore and evaluate interior and exterior ballistic component technologies to enhance weapon performance. ***FY 2016 Accomplishments:*** Evaluated state-of-art small arms technologies components to determine maturity for system integration; investigated small arms technologies capabilities to defeat current and future threats to the dismounted warfighter; conducted extensive analysis of available worldwide small arms systems and component technologies; leveraged small arms knowledge to better focus applied research efforts in support of Army small arms capabilities. ***FY 2017 Plans:*** Evaluate state-of-art small arms technologies components to determine maturity for system integration; investigate small arms technologies capabilities to defeat current and future threats to the dismounted warfighter; conduct extensive analysis of available worldwide small arms systems and component technologies; leverage small arms knowledge to better focus applied research efforts in support of Army small arms capabilities. ***FY 2018 Plans:*** Will investigate and mature a high pressure operating system capability to defeat current and future threats to the dismounted warfighter; investigate active stabilization technologies integrated with advance next generation fire control technologies to increase hit probabilities, increase kinetic speed to target and decrease engagement time; develop scalable precision munition technologies to a Technical Readiness Level (TRL) 4 to increase Warfighter capability in anti-materiel, anti-personnel and other specialized missions; develop to a TRL5 a Reduced Range Training Ammunition (RRTA) for reduced Surface Danger Zones	0.601	0.639	0.655

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
(SDZ) ranges with a trajectory match to current combat ammunition; develop a system and method, both accurate and repeatable, to measure blowback produced by small caliber suppressors.			
Accomplishments/Planned Programs Subtotals	5.270	5.545	5.615

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A