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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)					PE 0604802A / Weapons and Munitions - Eng Dev							
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	277.344	297.086	263.778	-	263.778	194.941	112.823	75.407	73.414	0.000	1,294.793
613: MORTAR SYSTEMS	-	0.497	-	1.036	-	1.036	-	-	-	-	0.000	1.533
BQ3: 155mm Artillery Propulsion XM654	-	-	29.803	26.485	-	26.485	15.217	-	-	-	0.000	71.505
BY1: Next Generation Combat Vehicle Ammunition	-	22.176	33.867	33.778	-	33.778	34.747	6.547	-	-	0.000	131.115
CE3: Precision Munition (Sniper)	-	-	9.275	5.182	-	5.182	-	-	-	-	0.000	14.457
EC4: Non-Standard Simulator Munitions	-	2.154	2.116	2.182	-	2.182	2.178	0.408	0.409	0.413	0.000	9.860
EL9: Ammunitions Logistics Prototyping	-	1.639	0.696	1.022	-	1.022	1.047	1.066	1.067	1.077	0.000	7.614
EP2: Shoulder-Launched Munitions	-	10.011	0.987	-	-	-	-	-	-	-	0.000	10.998
EP3: Reduced Range Ammunition - Small Caliber	-	13.816	11.150	5.214	-	5.214	-	-	-	-	0.000	30.180
EP4: One-Way Luminescence for Small Caliber Ammo	-	13.467	4.896	7.565	-	7.565	3.079	-	-	-	0.000	29.007
EP7: Aviation Airborne Expendable Countermeasures	-	4.313	7.526	6.363	-	6.363	-	-	-	-	0.000	18.202
EU4: 40mm HV Improved High Explosive Dual Purpose	-	9.357	2.111	2.073	-	2.073	-	-	-	-	0.000	13.541
EU5: .50 Caliber All-Purpose Tactical cartridge (APTC)	-	3.931	-	-	-	-	-	-	-	-	0.000	3.931
EU6: 155mm HE Rocket Assist Project Extended Range	-	51.956	27.655	14.382	-	14.382	29.380	15.911	2.701	-	0.000	141.985
EU7: Enhanced Lethality Cannon Munitions	-	15.000	-	-	-	-	-	-	-	-	0.000	15.000

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<i>EU8: Improved Multi-Option Fuze</i>	-	7.700	4.562	-	-	-	-	-	-	-	0.000	12.262
<i>EW1: 40mm Low Velocity Ammunition</i>	-	20.259	3.640	2.045	-	2.045	2.157	2.951	-	-	0.000	31.052
<i>FA6: 30mm Lethality</i>	-	22.359	8.939	8.653	-	8.653	3.078	-	-	-	0.000	43.029
<i>FJ4: Cannon-Delivered Area Effects Munitions (C-DAEM)</i>	-	20.079	85.997	92.402	-	92.402	86.869	70.359	55.644	56.185	0.000	467.535
<i>FL4: Small Caliber Ammo for Next Gen Squad Weapons</i>	-	26.483	28.372	25.558	-	25.558	12.058	12.168	12.172	12.291	0.000	129.102
<i>S36: Precision Guidance Kit</i>	-	32.147	35.494	29.838	-	29.838	5.131	3.413	3.414	3.448	0.000	112.885

A. Mission Description and Budget Item Justification

A portion of this funding line is a key enabler of the Army Modernization Priorities in support of the Long-Range Precision Guidance Kit (LR-PGK) and the Cannon Delivered Area Effects Munitions (C-DAEM).

Project 613, Mortar Systems: The Mortar System and Fire Control Modernization Project funds engineering development and demonstration of new technologies that will support modernized mortar weapon and mortar fire control systems. This includes capabilities that provide commonality between current and future weapon and fire control systems to help mitigate technology shortfalls and critical capability gaps. Future mortar systems that address these gaps include remote mortar turrets for mounted mortar systems, future cannon design study and improvements, round counter design effort, high-pressure capable cannons/components, and composite/lightweight components for mounted/dismounted systems as well any future mortar modernization efforts to improve system capability and performance to meet future capability gaps. Mortar Fire Control Systems capabilities include lightweight inertial measurement and navigation (IMU/INU) units for weapon pointing, simplified Ethernet/wireless-based digital communications interfaces, development of updated fire control software to enable commonality and modularity (plug and play capability), integration with existing/future platform interfaces to meet Modular Open Architecture Standard (MOSA), and support for commercial off-the-shelf (COTS)/modified commercial off-the-shelf (MCOTS) fire control components. FY 2023 funding will support Infantry Brigade Mortar System (IBMS) development and prototyping of a man-portable system for the Infantry Brigade Combat Teams (IBCTs) with range and lethality equal to or greater than the 120mm battalion mortar weapon system.

Project BQ3, 155mm Artillery Propulsion: Supercharge is a stand-alone top-zone 155 millimeter (mm) propelling charge required to achieve maximum range requirements from the Extended Range Cannon Artillery (ERCA) Self-Propelled Howitzer (SPH). Supercharge will achieve lethality overmatch out to 70 kilometers (km) with developmental extended range projectiles, and will potentially increase range with compatible legacy projectiles up to thirty percent. Supercharge is composed of an earlier bag variant and later combustible cartridge case, integral metal Stub Case, electrically initiated primer, and advanced artillery propellant. This project supports the accelerated Urgent Materiel Release (UMR) Supercharge (bag configuration) qualification required for FY 2023 Safety Release for First Unit Issued (FUI) of ERCA to perform FY 2024 Operational Assessment, and also supports the development of the Full Materiel Release (FMR) Supercharge that will address high technology and integration risks unique to achieving extended range to include improved design opportunities for pressure temperature curve, cannon tube wear and ensure fielding robustness. FY 2023 funding will conclude safety qualification of the UMR Supercharge, improve propellant for longer cannon life, conduct risk reduction activities and

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<p>continue component development and testing of the FMR Supercharge. These efforts directly support the Army's Long Range Precision Fires Cross Functional Team (LRPF CFT) priorities in support of the National Defense Strategy.</p> <p>Project BY1, Next Generation Combat Vehicle Ammunition: 50x228 millimeter (mm) family of ammunition is a critical technology development in response to the Next Generation Combat Vehicle (NGCV) Abbreviated Capability Development Document for weapon qualification, platform integration, and fielding of the Optionally Manned Fighting Vehicle (OMFV) primary weapon system (XM913). This effort includes the development of three capabilities: The XM1202 Target Practice with Trace (TP-T); the XM1203 Armor Piercing Fin Stabilized Discarding Sabot with Trace (APFSDS-T); and the XM1204 High Explosive Airburst with Trace (HEAB-T). The training cartridge will allow the Warfighter to train in a cost effective manner and the tactical cartridges will provide enhanced lethality at increased ranges when engaging personnel threats in the open, defilade, and under the cover of urban structures, Anti-Tank Guided Missiles (ATGM) teams, and current and projected future peer armored materiel threats. This effort is operating under Middle Tier Acquisition authority for rapid prototyping to qualify the three munitions in order to support the NGCV Cross Functional Team (CFT) timeline for First Unit Equipped (FUE). Fiscal Year (FY) 2023 funding will support Design Engineering Test (DET) 2 for HEAB-T performance as well as Developmental Test and Evaluation (DT&E) for TP-T and APFSDS-T cartridges</p> <p>Project CE3, The Precision Munition (Sniper) project is a critical technology development in response to the Precision Munition Capabilities Development Documents (CDD) for the ammunition required to support the Precision Sniper Rifle (PSR) / sniper weapons systems. The objective is to transfer the latest lethality technology into the suite of ammunition used by snipers. The Precision Munition improvement is split into three capability areas: Anti-Materiel (AM), Improved Performance Round (IPR), and Subsonic. The AM and IPR capabilities will enhance lethal effects at greater distances. The Subsonic capability will increase soldier survivability at close range by providing a low-sound signature munition that is undetectable to the enemy. Fiscal Year (FY) 2023 funding supports development of the AM munitions, evaluation of ammunition prototypes/concepts, and prototype build and testing. FY 2023 also supports evaluating industry/Government Subsonic and IPR munitions solutions.</p> <p>Project EC4, Non-Standard Simulator Munitions will standardize various pyrotechnics that simulate battlefield effects. The Army's Combat Training Centers (CTCs) are currently using non-standard munitions to replicate both conventional and asymmetric warfare battlefield effects. These modified commercial-off-the-shelf products have not been type classified or material released and are not safe or sustainable for use by Soldiers. This effort will develop and demonstrate various pyrotechnics/simulators to replicate both conventional and asymmetric warfare battlefield affects such as: Black smoke signature (burning vehicles, buildings, and equipment); Yellow smoke signature (chemical, biological or nuclear effects); Mini Blast to simulate hostile fire and small Improvised Explosive Devices (IEDs) during mounted operations in urban terrain; Micro pyrotechnics to simulate indoor hostile fire and IED effects that are capable of being integrated into existing facilities; Rocket Propelled Grenade (RPG) simulators to replicate the flight of a Rocket Propelled Grenade; Macro Pyro to simulate hostile fire, booby trap and IED Simulations indoor and outdoors; High Order Blast Effect (HiOBE) used to replicate a Vehicle Borne Improvised Explosive Device (VBIED), building explosions, and other significant explosive events; Artillery airburst simulator to replicate indirect fire; Antitank Guided Missile and Rocket (AGMR) simulator to replicate surface to air missile or shoulder launched rocket; Tracer Fire-back simulator to replicate enemy small arms fire and anti-aircraft fire. Standardization will reduce training costs, eliminate redundancies between systems and mitigate environmental concerns and safety risks associated with realistic scenario based training.</p> <p>Project EL9, Ammunition Logistics Prototyping: This Project supports the future force by improving the distribution, management, reliability and survivability of ammunition through the advanced development, integration, and demonstration of logistics system enablers. These enablers will improve the efficiency and effectiveness of ammunition operations, to include retrograde, while reducing the logistics footprint on the battlefield. Technology areas addressed include handling,</p>		

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<p>distribution, and management (strategic and tactical), prognostics, diagnostics, and asset visibility, explosives safety, and adaptive and environmentally friendly packaging and palletization. The efficient deployment and sustainment of reliable ammunition is vital to success on the battlefield. This project enhances the operational effectiveness of the ammunition logistics system to ensure the distribution of reliable ammunition to the warfighter. Fiscal Year (FY) 2023 funding will be focused on integrating commercial off the shelf and/or relatively mature technologies into ammunition resupply enablers required by the Long Range Precision Fire (LRPF) Cross Functional Team (CFT). They will be focused on ensuring that a low risk resupply process solution exists to support the success of the Extended Range Canon Artillery (ERCA).</p> <p>Project EP2, Shoulder-Launched Munitions: The Individual Assault Munition (IAM) system consists of the tactical XM919 and training devices including the XM922 sub-caliber trainer. The XM919 IAM will be a lightweight Shoulder Launched Munition (SLM) capability for combat units at the individual Soldier level. The IAM training devices including the XM922 sub-caliber trainer provide training capability that will increase the Soldier's proficiency and integration of the XM919 tactical system into combat operations. As the next generation SLM, the solution will fit within the Soldier Lethality Modernization Priority, by reducing Soldier load, while providing tactical innovation capable of extending overmatch against near-peer adversaries in a joint, multi-domain, high-intensity conflict. The tactical XM919 IAM will allow Soldiers to conduct Urban Operations and will allow Soldiers to defeat adversaries protected by field expedient structures and light armored vehicles while providing behind the wall lethality effects. This solution will be effective day or night with the ability to safely engage targets from within enclosures, increasing Soldier survivability. This solution will combine the capabilities of the existing Bunker Defeat Munition (BDM) and the AT4 Confined Space - Reduced Sensitivity (AT4CS-RS), which will reduce the logistics burden of having to maintain and train multiple systems. The Individual Assault Munition Capabilities Development Document (CDD) was approved on 11 March 2016.</p> <p>Project EP3, Reduced Range Ammunition - Small Caliber: The small caliber Reduced Range Ammunition (RRA) Project is a critical technology development in response to the 7.62 millimeter (mm) and .50 caliber Capabilities Development Documents (CDD). The overall objective of RRA is to provide training ammunition suitable for use on military installations with Surface Danger Zone (SDZ) restrictions. The relatively long maximum range of the 7.62mm and .50 caliber service ammunition poses challenges on training ranges in range restricted areas. RRA will mitigate a training gap on installations by providing a materiel solution that meets training needs while shortening and condensing the SDZ. This will allow soldiers to train with 7.62mm and .50 caliber weapons on restricted ranges. The RRA cartridge design will be compatible with all Army 7.62mm and .50 caliber weapons, but specifically optimized to work in the M240 and M2 Machine Guns. Fiscal Year (FY) 2023 funding supports completing Engineering and Manufacturing Development (EMD) efforts, completing Production Qualification Testing (PQT), and performing activities to prepare for ammunition production transition to the Lake City Army Ammunition Plant (LCAAP) in preparation for Low-Rate Initial Production (LRIP) on the 7.62mm variant. FY 2023 also includes completing the EMD effort, complete safety release testing, conducting a Limited User Assessment (LUA) / User Evaluation, and completing PQT on the .50 caliber variant.</p> <p>Project EP4, One-Way Luminescence for Small Caliber Ammo: The One Way Luminescence (OWL) project is a critical technology development in response to the 7.62 millimeter (mm) and 5.56mm Families of Ammunition Capabilities Development Documents (CDD) and .50 Caliber Munitions CDD. Current small caliber ammunition tracer rounds are a pyrotechnic tracer mix which allows enemy forces to see the trace round and track its trajectory back to the shooter. The OWL projects objective is to develop and field a full tracer round, replace the current pyrotechnic cartridges with trace cartridges that are only visible to the shooter and soldiers in close proximity, increasing soldier survivability, and increasing lethality by incorporating Enhanced Performance Round (EPR) technology into the new tracer ammunition. 7.62mm and 5.56mm are the immediate focus; later followed by .50 Caliber cartridges and Next Generation Squad Weapons (NGSW) ammunition. Fiscal Year (FY) 2023 funding will</p>		

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<p>support continuing Engineering and Manufacturing Development (EMD), performing Production Qualification Testing (PQT), conducting Live Fire Test and Evaluation (LFT&E), and performing preparation activities for manufacturing at the Lake City Army Ammunition Plant (LCAAP) in preparation for Low-Rate Initial Production (LRIP) for the 7.62mm variant. FY 2023 funding will also support EMD efforts, performing PQT, conducting LFT&E, and a Soldier Touch Point (STP) / User Evaluation for the 5.56mm variant.</p> <p>Project EP7, Aviation Airborne Expendable Countermeasures (AAECM) will support Integrated System Design (ISD), System Capability (SC) and Manufacturing Process Demonstrations (MPD) on expendable countermeasure flares and decoys to include the XM215 Infrared (IR) countermeasure Flare and XM20 Radio Frequency (RF) expendables. These expendable countermeasures systems are an essential part of survivability equipment for Army aircraft. Army Research Development Technology & Evaluation (RDT&E) efforts are coordinated with Program Executive Office (PEO) Aviation to address the AAECM capability, a critical enabler for enduring aircraft and the Future Vertical Lift (FVL) - Aircraft Survivability Equipment (ASE) Cross Functional Team (CFT) within Army's Top modernization priorities.</p> <p>These advanced decoys will address deficiencies in Army aircraft protection and the safety of its aircrews against advanced Man-Portable Air Defense Systems (MANPADS) and Surface-to-Air Missiles (SAM) systems. The project will also support ISD, SC and MPD on new expendable countermeasure munitions that will protect Army aircraft from advanced and proliferated current guided missile threats. Activities include modeling and simulation, flight testing, qualification testing, environmental considerations, safety enhancements, manufacturing enhancements, qualification of other service and foreign munitions that could meet current requirements, product improvements, insertion of new technologies to increase performance, and enhancement of current flare solutions for new and existing aircraft. Systems include impulse cartridges and aircraft expendables (to include RF expendables).</p> <p>Project EU4, 40 millimeter (mm) High Velocity (HV) High Explosive Dual Purpose - Air burst (HEDP-AB) is a new capability identified as a Warfighter counter-defilade requirement in the 40mm High Velocity Improved High Explosive Dual Purpose Cartridge Capability Development Document (CDD) and will provide the Mk19 Mod 3 Grenade Machine Gun (GMG) an airburst capable cartridge with the ability of achieving required lethal effects against enemy targets in the open and in defilade while maintaining the capability to defeat unarmored and lightly armored vehicles. XM1176 HEDP-AB cartridges are manufactured by de-fuzing legacy M430A1 cartridges and installing a new airburst capable fuze onto the M430A1 warhead. FY 2023 funding supports the Live Fire Testing & Evaluation (LFT&E) that is required due to the program being on Director, Operational Test & Evaluation (DOT&E) Oversight.</p> <p>Project EU5, .50 Caliber All-Purpose Tactical cartridge (APTC): The APTC project is a critical technology development in response to the .50 caliber Munitions Capabilities Development Documents (CDD). The overall objective of All-Purpose Tactical Cartridge is to deliver Ball and Tracer ammunition that replaces and improves current legacy .50 caliber ammunition. The All-Purpose Tactical Cartridge will be compatible with all Army .50 caliber weapons but specifically optimized to work in the M2 Machine Guns. There is no Fiscal Year (FY) 2023 request.</p> <p>Project EU6, 155mm HE Rocket Assist Project Extended Range: The 155 millimeter (mm) High Explosive (HE) Rocket Assisted Projectile, Extended Range Project supports projectile development efforts to achieve ranges of 40km in current 39 caliber artillery weapon systems and longer ranges in future 58 caliber Extended Range Cannon Artillery (ERCA) Self-Propelled Howitzer (SPH) to achieve the Army's requirement of extended range lethality. The Project is executing an evolutionary approach consisting of two parallel efforts to meet the objectives of extended range and precision. The XM1113 will replace the obsolete M549A1 in 39 caliber weapon</p>		

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<p>systems and increase range from 30km to 40km. The XM1210 (formerly known as XM1113ER) will be optimized for 58 caliber guns and allow commanders to provide accurate cannon artillery fires at ranges of 70km and greater with ERCA. These efforts will leverage enhanced lethality cannon munition technologies to compensate for increased rocket motor volume. Fiscal Year (FY) 2023 funding will support the completion of XM1113 qualification activities, engineering efforts to evaluate test data to ensure that the projectile is safe, suitable and operationally effective as well as the gathering of all statutory and regulatory requirements in support of a Milestone C and Full Materiel Release (FMR). FY 2023 funding will also support XM1210 qualification and firing tables testing required for Safety Release for First Unit Issued (FUI) to support the ERCA Operational Assessment, Urgent Materiel Release (UMR) qualification activities and the initiation of FMR development activities.</p> <p>Project EU7, Enhanced Lethality Cannon Munitions: The Enhanced Lethality Cannon Munitions (ELCM) Project will evaluate, develop, and qualify new lethality technologies for 155mm cannon artillery munitions and evaluate their effectiveness in mitigating evolving and derived capability gaps, and support transition to production. The ELCM Project supports testing and assessment of the Israeli Military Industries (IMI) Systems M999 advanced anti-personnel munition in support the Army Directed Requirement for a Rapid Bridging Solution for the replacement of the 155mm Dual Purpose Improved Conventional Munition (DPICM). This Project also accelerates the qualification of the 155mm XM1128 High Explosive Projectile, which will replace the M795 Critical Munition once qualified. Engineering efforts are ongoing and will support the evaluation of the XM1128 test data to determine that the Program is safe, suitable and operationally effective, as well as the gathering of all statutory and regulatory requirements in support of a Milestone C in FY 2021. This Project does not have a Fiscal Year (FY) 2023 budget request.</p> <p>Project EU8, Improved Multi-Option Fuze: The Improved Multi-Option Fuze Project is a technology refresh and modernization effort that provides an incremental capability with technology advancements and performance improvements on the current non-precision artillery and mortar ammunition proximity multi-option fuze that will increase robustness to electronic countermeasures (ECM), eliminates the susceptibility of reverse engineering (RE), incorporates power source advancements, improves delay mode reliability, and integrates safe & arm improvements. This Project will develop and qualify safe, affordable, reliable, Proximity Height of Burst fuzing solutions with robust Defense Exportability Features (DEF) for non-precision conventional cannon artillery and mortar munitions that are resistant to adversary exploitation via ECM and RE threats. This Project does not have a Fiscal Year (FY) 2023 budget request.</p> <p>Project EW1, The 40 millimeter (mm) Low Velocity High Explosive Air Burst (HEAB) is a new capability identified as a Warfighter counter-defilade requirement in the Capability Development Document (CDD), 40mm Low Velocity (LV) Family of Ammunition Annex. The HEAB tactical cartridge allows the Warfighter to engage targets at increased effective ranges using the 40mm M320 Grenade Launcher. The HEAB cartridge provides the grenadier with a higher probability of achieving a first shot kill against enemy personnel, coupled with the ability to defeat personnel targets in defilade positions. When deployed against point and area targets, the cartridge inflicts incapacitating effects against personnel beyond those offered by the current M433 High Explosive Dual Purpose (HEDP) cartridge. The cartridge provides lethal effects against targets with improved accuracy and greater standoff ranges resulting in increased soldier survivability. FY 2023 activities will include the continuation of Developmental Test & Evaluation (DT&E), support for Milestone C, execution of an additional Soldier Touch Point (STP 4) and the award of a follow on Low Rate Initial Production (LRIP) contract.</p> <p>Project FA6, 30mm Lethality: The 30 millimeter (mm) Lethality project funds the development of a suite of 30x173mm caliber cartridges, which includes a XM1182 High Explosive Airburst with Trace (HEAB-T) cartridge for increased anti-personnel effects, XM1170 Armor Piercing Fin Stabilized Discarding Sabot with Trace (APFSDS-T) cartridge for anti-materiel, and ballistically matched training cartridges; XM1173 Target Practice with Trace (TP-T) cartridge and XM1172 Target Practice Discarding Sabot with Trace (TPDS-T) cartridge. The objective is to enhance the operational effectiveness and lethality of the Stryker Infantry Carrier Vehicle (ICV),</p>		

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Next Generation Combat Vehicle (NGCV), and any Army Fighting Vehicles that are equipped with a 30x173mm weapon system. The tactical APFSDS-T cartridge will provide an organic direct fire capability to support infantry at a greater range and will improve lethality when engaging light-to-medium armored vehicles. The HEAB-T cartridge will provide the Warfighter with increased lethality against troops in the open, counter defilade, Anti-Tank Guided Missile (ATGM) teams, and troops behind urban structures. The training cartridges will be ballistically matched to the tactical cartridges, allowing the Warfighter to train in a cost effective manner. This project is a follow-on of the earlier efforts in support of the United States Army Europe (USAREUR) Operational Needs Statement (ONS) #15-20590 Stryker Increased Lethality for the 2nd Cavalry Regiment (2CR). Fiscal Year (FY) 2023 funding will support the continuation of Engineering, Manufacturing and Development (EMD) for all cartridges to include completion of Developmental Test & Evaluation (DT&E), preparation and execution of Milestone C decision, platform integration testing, and Live Fire Test & Evaluation (LFT&E) hardware fabrication and test assets.

Project FJ4, Cannon-Delivered Area Effects Munitions (C-DAEM): The Cannon-Delivered Area Effects Munitions (C-DAEM) Project will provide United States (U.S.) ground forces with the capability to engage area personnel through armored targets, while denying threat forces full operational freedom within the targeted area. An Analysis of Alternatives (AoA) was completed in January 2018 to inform Army acquisition and investment decisions regarding replacement of the current stockpile of 155 millimeter (mm) Dual Purpose Improved Conventional Munitions (DPICM) with Department of Defense (DoD) policy compliant munitions and address anti-armor and extended range capability requirements. The Army validated two materiel solutions for C-DAEM to be pursued in parallel to support the Army's modernization priorities; C-DAEM Armor and C-DAEM DPICM Replacement. C-DAEM Armor will destroy moved and moving self-propelled howitzers, infantry fighting vehicles and tanks. Fiscal Year (FY) 2023 funding will continue to support the development and testing of the selected C-DAEM Armor solution(s) for Urgent Materiel Release (UMR) and engineering efforts required to integrate the NavStorm-M (M-Code) Global Positioning System (GPS) Receiver into the most promising C-DAEM Armor objective materiel solution(s). C-DAEM DPICM Replacement will destroy personnel to soft-skinned targets. The Army has approved the Israeli M999 advanced anti-personnel munition, now designated the U.S. model XM1208, as the C-DAEM DPICM Replacement solution. FY 2023 funding will support the completion of XM1208 qualification activities and support engineering efforts to evaluate test data to ensure DoD policy compliance and that the round is safe, suitable and operationally effective, as well as the gathering of all statutory and regulatory requirements in support of a Milestone C.

Project FL4, Small Caliber Ammo for Next Gen Squad Weapons: The Small Caliber Ammo for Next Gen Squad Weapons project is a critical technology development in response to the Soldier Lethality Cross Functional Team (SL CFT) Initial Capability Document (ICD) for the ammunition required to support the rapid prototyping, development, and fielding of the Next Generation Squad Weapons (NGSW) under the Middle Tier of Acquisition (MTA) authority for rapid prototyping/rapid fielding. The objective is to develop and Full Materiel Release (FMR) the new ammunition in parallel with the NGSW rifle and automatic rifle. The NGSW ammunition is split into multiple ammunition variants, the General Purpose (GP), the Special Purpose (SP), the Reduced Range Ammunition (RRA), Tracer Ammunition, Blank Ammunition, the Close Combat Mission Capability Kit (CCMCK) training ammunition, Drill Dummy Inert (DDI) cartridge, and High Pressure Test (HPT) cartridge. Fiscal Year (FY) 2023 funding supports performing optimization efforts on the GP variant. FY 2023 also supports continuing rapid prototyping for the SP projectile, manufacturing prototype ammunition required for Developmental Testing (DT), and conducting DT. FY 2023 supports continuing rapid prototyping efforts to develop RRA and RRA-Tracer for the NGSW, continuing weapon and cartridge integration efforts, and executing projectile optimization efforts. FY 2023 also supports continuing rapid prototyping effort to develop tracer ammunition for the NGSW, building and testing tracer ammunition prototypes, and maturing/refining down-selected tracer ammunition design. FY 2023 supports continuing rapid prototyping effort to mature the Blank ammunition and activities to accelerate the development/maturation of Blank ammunition designs. FY 2023 also supports continuing rapid prototyping effort to develop CCMCK training ammunition for the NGSW, building and evaluating competing CCMCK

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training ammunition designs/concepts, down-selecting to a CCMCK design, begin the process of maturing/refining selected design by performing engineering tests and implementing improvements based upon test results. FY 2023 also supports continuing the refining and development of the DDI and HPT cartridges.

Project S36, Precision Guidance Kit: The Long Range-Precision Guidance Kit (LR-PGK) XM1171/XM1172 development effort will qualify state of the art technologies for a course correcting fuze that provides precision accuracy at extended ranges for current and future 155 millimeter (mm) High Explosive (HE) projectiles by eliminating a portion of the inherent errors associated with ballistic firing solutions, which effectively reduces the number of projectiles required to execute fire missions. LR-PGK will support projectile operation in Global Positioning System (GPS) degraded environments and compatibility with Army Modernization objectives under the Long Range Precision Fires Cross Functional Team's (LRPF CFT) new long range cannon, Extended Range Cannon Artillery (ERCA) Self-Propelled Howitzer (SPH). The ERCA and its new long range projectiles require the LR-PGK to meet lethality requirements. Fiscal Year (FY) 2023 funding supports the build and safety and development testing of the LR-PGK Urgent Materiel Release (UMR) configuration as well as development of the Full Materiel Release (FMR) design configuration.

B. Program Change Summary (\$ in Millions)	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	268.858	309.778	0.000	-	0.000
Current President's Budget	277.344	297.086	263.778	-	263.778
Total Adjustments	8.486	-12.692	263.778	-	263.778
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-12.564			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	8.486	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	263.778	-	263.778
• FFRDC Transfer	-	-0.128	-	-	-

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

Project: EU6: *155mm HE Rocket Assist Project Extended Range*

Congressional Add: *Precision Guidance Aft*

Congressional Add Subtotals for Project: EU6

Project: EU7: *Enhanced Lethality Cannon Munitions*

Congressional Add: *155mm XM1128 High Explosive Projectile*

Congressional Add Subtotals for Project: EU7

	FY 2021	FY 2022
	21.000	-
Congressional Add Subtotals for Project: EU6	21.000	-
	15.000	-
Congressional Add Subtotals for Project: EU7	15.000	-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>
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Congressional Add Details (\$ in Millions, and Includes General Reductions)

	FY 2021	FY 2022
Congressional Add Totals for all Projects	36.000	-

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) 613 / MORTAR SYSTEMS			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
613: MORTAR SYSTEMS	-	0.497	-	1.036	-	1.036	-	-	-	-	0.000	1.533
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Mortar System and Fire Control Modernization Project funds engineering development and demonstration of new technologies that will support modernized mortar weapon and mortar fire control systems. This includes capabilities that provide commonality between current and future weapon and fire control systems to help mitigate technology shortfalls and critical capability gaps. Future mortar systems that address these gaps include remote mortar turrets for mounted mortar systems, future cannon design study and improvements, round counter design effort, high-pressure capable cannons/components, tactical vehicle integration and composite/lightweight components for mounted/dismounted systems as well any future mortar modernization efforts to improve system capability and performance to meet future capability gaps. Mortar Fire Control Systems capabilities include lightweight inertial measurement and navigation (IMU/INU) units for weapon pointing, simplified Ethernet/wireless-based digital communications interfaces, development of updated fire control software to enable commonality and modularity (plug and play capability), integration with existing/future platform interfaces to meet Modular Open Architecture Standard (MOSA), and support for commercial off-the-shelf (COTS)/modified commercial off-the-shelf (MCOTS) fire control components. FY 2023 funding will support Infantry Brigade Mortar System (IBMS) development and demonstration of a man-portable system for the Infantry Brigade Combat Teams (IBCTs) with range and lethality equal to or greater than the 120mm battalion mortar weapon system.

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

	FY 2021	FY 2022	FY 2023
Title: Mortar System & Fire Control Modernization	0.497	-	1.036
Description: Mortar Systems and Fire Control Modernization initiatives include development and demonstration of new technologies to validate production potential for future mortar systems; including remote turrets and new weapon system components, modernized lightweight pointing device, updated Line Replaceable Units (LRUs), streamlined digital communications, and updated mortar fire control software.			
FY 2023 Plans: FY 2023 funding will support Infantry Brigade Mortar System (IBMS) development and demonstration of a man-portable system for the Infantry Brigade Combat Teams (IBCTs) with range and lethality equal to or greater than the 120mm battalion mortar weapon system. Efforts include studies of new steel barrel materiel, new barrel design and testing to address current and future IBCT capability gaps. The design will encompass studying of new barrel technology, market surveys of new steel materiel, and prototyping and testing of newly developed barrel design concepts. The objective for the new design will be to provide extended range, reduced pressure, seamless platform integration and reduction in weight. The light weight design will allow soldiers to perform mounted and dismounted operation seamlessly.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) 613 / MORTAR SYSTEMS

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
FY22 was a skip year of funding. FY23 funding necessary to support IBMS development and demonstration of a man-portable system.			
Accomplishments/Planned Programs Subtotals	0.497	-	1.036

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• AD9300: Mortar Fire Control Systems Modifications	7.292	2.830	4.370	-	4.370	3.243	3.335	4.614	4.613	0.000	30.297
• K99200: Computer Ballistics: LHMBBC XM32	7.789	2.811	3.038	-	3.038	3.026	3.094	6.760	6.757	0.000	33.275
• K99300: Mortar Fire Control System	17.472	17.236	4.879	-	4.879	4.936	4.874	3.886	3.904	0.000	57.187
• G02200: Mortar Systems	20.748	32.985	8.516	-	8.516	6.961	8.733	14.849	14.487	Continuing	Continuing
• G02100: Mortar Modification	1.689	-	0.000	-	0.000	-	-	-	-	0.000	1.689

Remarks
Other Procurement, Army (OPA) Funding / Procurement of Weapons & Tracked Combat Vehicle (W&TCV)

D. Acquisition Strategy
The Mortar System and Fire Control Modernization strategy will utilize Government Owned Government Operated (GOGO) Watervliet Arsenal (WVA) facility for cannon barrel prototyping, Combat Capabilities Development Command Armament Center (DEVCOM AC) for studies and competitively awarded Department of Defense Ordnance Technology Consortium (DOTC) and/or Cornerstone Other Transaction Agreement (OTA) initiatives for hardware and software development during Engineering Manufacturing Design Phase. A Federal Acquisition Regulation (FAR) contract will be awarded to complete full rate production.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) 613 / MORTAR SYSTEMS
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Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Mortar System & Fire Control Modernization - Project Manager Office Support	Various	Office of the Project Manager (PM) Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ	0.212	-		-		0.025	Nov 2022	-		0.025	0.000	0.237	-
Subtotal			0.212	-		-		0.025		-		0.025	0.000	0.237	N/A

Remarks
Program management includes travel and documentation support.

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Mortar Stowage Lift System	MIPR	Other Transaction Agreement (OTA) : TBS	-	-		-		0.386	Dec 2022	-		0.386	0.000	0.386	-
Subtotal			-	-		-		0.386		-		0.386	0.000	0.386	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Mortar System & Fire Control Modernization Engineering Support	MIPR	DEVCOM Armament Center : Picatinny Arsenal, NJ and Watervliet Arsenal, NY	-	0.497	Mar 2021	-		0.625	Oct 2022	-		0.625	0.000	1.122	-
Subtotal			-	0.497		-		0.625		-		0.625	0.000	1.122	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) 613 / <i>MORTAR SYSTEMS</i>

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027																
	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													
Mortar System Round Counter																																									
Engineering & Manufacturing Development (EMD)	EMD Preliminary & Detailed Design																																								
LRU Software Development	LRU Software Dev																																								
Mortar System Round Counter- System Architecture Development	Sys Eng Phase 1																																								
Preliminary Design Review (PDR)	2 PDR																																								
EMD Detailed Design Testing (Sys Eng Phase 2)	EMD Detailed Design Testing (Sys Dev Phase 2)																																								
Critical Design Review (CDR)					3 CDR																																				
Mortar Stowage Lift System																																									
Engineering & Manufacturing Development (EMD)									EMD Preliminary & Detailed Design																																
System Requirement Review (SRR)									5 SRR																																
Preliminary Design Review (PDR)													6 PDR																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) 613 / <i>MORTAR SYSTEMS</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Mortar System Round Counter	1	2021	1	2021
Engineering & Manufacturing Development (EMD)	1	2020	4	2021
LRU Software Development	1	2020	4	2021
Mortar System Round Counter- System Architecture Development (Sys Eng Phase 1)	1	2020	1	2021
Preliminary Design Review (PDR)	1	2021	1	2021
EMD Detailed Design Testing (Sys Eng Phase 2)	2	2021	4	2021
Critical Design Review (CDR)	4	2021	4	2021
Mortar Stowage Lift System	1	2023	1	2023
Engineering & Manufacturing Development (EMD)'	1	2023	4	2023
System Requirement Review (SRR)	2	2023	2	2023
Preliminary Design Review (PDR)'	4	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) BQ3 / 155mm Artillery Propulsion XM654			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
BQ3: 155mm Artillery Propulsion XM654	-	-	29.803	26.485	-	26.485	15.217	-	-	-	0.000	71.505
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Supercharge is a stand-alone top-zone 155 millimeter (mm) propelling charge required to achieve maximum range requirements from the Extended Range Cannon Artillery (ERCA) Self-Propelled Howitzer (SPH). Supercharge will achieve lethality overmatch out to 70 kilometers (km) with developmental extended range projectiles, and will potentially increase range with compatible legacy projectiles up to thirty percent. Supercharge is composed of an earlier bag variant and later combustible cartridge case, integral metal stub case, electrically initiated primer, and advanced artillery propellant. This project supports the accelerated Urgent Materiel Release (UMR) Supercharge (bag configuration) qualification required for FY 2023 Safety Release for First Unit Issued (FUI) of ERCA to perform FY 2024 Operational Assessment, and also supports the development of the Full Materiel Release (FMR) Supercharge that will address high technology and integration risks unique to achieving extended range to include improved design opportunities for pressure temperature curve, cannon tube wear and ensure fielding robustness. FY 2023 funding will conclude safety qualification of the UMR Supercharge, improve propellant for longer cannon life, conduct risk reduction activities and continue component development and testing of the FMR Supercharge. These efforts directly support the Army's Long Range Precision Fires Cross Functional Team (LRPF CFT) priorities in support of the National Defense Strategy.

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

	FY 2021	FY 2022	FY 2023
Title: 155mm Artillery Propulsion Supercharge	-	28.715	26.485
Description: The top-zone propelling charge for XM907E2 Extended Range Cannon with Slide-block breech for use with Extended Range Cannon Artillery (ERCA) to gain range overmatch for 155mm artillery.			
FY 2022 Plans: Fiscal Year (FY) 2022 funding supports UMR Supercharge qualification required for FY 2023 Safety Release for First Unit Issued (FUI) of ERCA to perform Operational Assessment. This project will also establish a digital thread as well as conduct risk reduction activities and component development of FMR Supercharge.			
FY 2023 Plans: FY 2023 funding will conclude safety qualification of the UMR Supercharge, improve propellant for longer cannon life, conduct risk reduction activities and continue component development and testing of the FMR Supercharge.			
FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 funding decreases with the completion of safety qualification of UMR Supercharge.			
Title: Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR)	-	1.088	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) BQ3 / 155mm Artillery Propulsion XM654
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: FY 2022 funding to be assess per SBIR Title 15 USC ?638(f)(1) and STTR Title 15 USC ?638(f)(1)(A).			
FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 SBIR/STTR to be assessed within year of execution.			
Accomplishments/Planned Programs Subtotals	-	29.803	26.485

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• BQ4: 155mm Artillery Propulsion XM654	15.131	-	0.000	-	0.000	-	-	-	-	0.000	15.131
• E99350: 155mm Artillery Supercharge XM654	-	0.010	7.802	-	7.802	16.891	29.337	45.020	63.773	0.000	162.833

Remarks
A Procurement of Ammunition, Army (PAA) budget line item, Standard Study Number (SSN) E99350, will resource procurement of the Supercharge to deliver Safety Release quantities for First Unit Issued (FUI) to support the Extended Range Cannon Artillery (ERCA) Operational Assessment (OA) as well as future Urgent Materiel Release (UMR) and Full Materiel Release (FMR) quantities.

D. Acquisition Strategy
The Supercharge Project consists of critical technology prototyping, testing, and demonstration of two variants: (1) the UMR Supercharge (2-piece Bag configuration) to support the acceleration of the Extended Range Cannon Artillery (ERCA) to achieve precision lethality at 70km and greater in FY 2023 and follow-on UMR, and (2) the FMR Supercharge, which will address high technology and integration risks unique to achieving increased range.

The UMR Supercharge will utilize several competitively awarded Defense Ordnance Technology Consortium (DOTC) Other Transaction Agreement (OTA) Initiatives for the maturation and integration of components. These contracts will execute UMR Supercharge through qualification testing as well as transition to procurement of quantities required for FY 2023 Safety Release for First Unit Issued (FUI) of ERCA to perform Operational Assessment. Federal Acquisition Regulation (FAR) based production contract(s) will be awarded for UMR quantities.

The FMR Supercharge will also utilize several competitively awarded DOTC OTA Initiatives for design risk reduction of the various new and existing Supercharge components, system integration, developmental testing and qualification. Propulsion risk reduction activities will be applied to address UMR Supercharge temperature sensitivity, energy, tube wear, rough handling robustness and muzzle pressure/ blast overpressure. FAR based production contract(s) will be awarded.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) BQ3 / 155mm Artillery Propulsion XM654
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Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	Various	Office of the Project Manager (PM) Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ	-	-		0.300	Oct 2021	0.300	Oct 2022	-		0.300	0.000	0.600	-
FY 2022 Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR)	Various	Various : N/A	-	-		1.088	Mar 2022	-		-		-	0.000	1.088	-
Subtotal			-	-		1.388		0.300		-		0.300	0.000	1.688	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Combustible Case Components	MIPR	DoD Ordnance Technology Consortium (DOTC): Armtec : Coachella, CA	-	-		3.171	Nov 2021	3.000	Nov 2022	-		3.000	0.000	6.171	-
Main Charge Propellants	MIPR	DoD Ordnance Technology Consortium (DOTC): General Dynamics Ordnance and Tactical Systems - Valleyfield : Salaberry-de-Valleyfield, Quebec, Canada	-	-		3.434	Oct 2021	1.368	Nov 2022	-		1.368	0.000	4.802	-
Electric Primers	MIPR	Day & Zimmermann Lone Star LLC : Texarkana, TX	-	-		0.425	Apr 2022	0.225	Mar 2023	-		0.225	0.000	0.650	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				BQ3 / 155mm Artillery Propulsion XM654							
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Packaging	MIPR	DoD Ordnance Technology Consortium (DOTC): Savit Corporation : Rockaway, NJ	-	-		0.522	Apr 2022	0.550	Mar 2023	-		0.550	0.000	1.072	-
Main Load Assemble & Pack	MIPR	DoD Ordnance Technology Consortium (DOTC): General Dynamics Ordnance and Tactical Systems - Marion, IL : Marion, IL	-	-		1.650	Nov 2021	2.500	Nov 2022	-		2.500	0.000	4.150	-
Supercharge FMR Risk Reduction	TBD	Various/ TBS : TBS	-	-		4.700	Mar 2022	7.792	Mar 2023	-		7.792	0.000	12.492	-
Projectile and Fuze Hardware	Various	Various : Various	-	-		6.906	Nov 2021	3.800	Mar 2023	-		3.800	0.000	10.706	-
Software Engineering	Reqn	Leidos, Inc. : Reston, Virginia	-	-		1.350	Aug 2022	1.200	Aug 2023	-		1.200	0.000	2.550	-
Subtotal			-	-		22.158		20.435		-		20.435	0.000	42.593	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	-	-		4.210	Nov 2021	3.750	Nov 2022	-		3.750	0.000	7.960	-
Subtotal			-	-		4.210		3.750		-		3.750	0.000	7.960	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) BQ3 / 155mm Artillery Propulsion XM654
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Supercharge UMR Qualification	MIPR	Army Test & Evaluation Command (ATEC): Yuma Proving Ground : Yuma, AZ	-	-		1.647	Nov 2021	1.000	Nov 2022	-		1.000	0.000	2.647	-
Supercharge FMR Testing	MIPR	Army Test & Evaluation Command (ATEC): Yuma Proving Ground : Yuma, AZ	-	-		0.400	May 2022	1.000	Nov 2022	-		1.000	0.000	1.400	-
Subtotal			-	-		2.047		2.000		-		2.000	0.000	4.047	N/A
			Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract				
Project Cost Totals			-	-	29.803	26.485	-	26.485	0.000	56.288	N/A				

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) BQ3 / 155mm Artillery Propulsion XM654

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Urgent Materiel Release (UMR) Supercharge																												
Preliminary Design Review (PDR)																												
Prototype Development & Testing																												
Qualification Testing for Safety Release																												
Critical Design Review (CDR)																												
Safety Release Decision Point (DP) / Contract Award																												
Deliveries for ERCA Operational Assessment (OA)																												
Safety Release for ERCA FUI																												
ERCA FUI																												
ERCA System of Systems (SoS) OA																												
UMR																												
Full Materiel Release (FMR) Supercharge																												
Engineering Manufacturing & Development (EMD)																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) BQ3 / 155mm Artillery Propulsion XM654

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Propellant Optimization																												
Propellant PDR																												
Propellant CDR																												
Charge Design																												
Charge Design PDR																												
Charge Design CDR																												
Qualification Testing																												
FMR																												

Note
 UMR Supercharge is pursuing a Safety Release to support ERCA System of Systems Operational Assessment. All Safety Release, UMR and FMR quantities will be procured with the associated Procurement of Ammunition, Army (PAA) funding.

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) BQ3 / <i>155mm Artillery Propulsion XM654</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Urgent Materiel Release (UMR) Supercharge	1	2022	1	2022
Preliminary Design Review (PDR)	1	2021	1	2021
Prototype Development & Testing	1	2021	4	2021
Qualification Testing for Safety Release	1	2022	2	2023
Critical Design Review (CDR)	2	2022	2	2022
Safety Release Decision Point (DP) / Contract Award	4	2022	4	2022
Deliveries for ERCA Operational Assessment (OA)	4	2023	4	2023
Safety Release for ERCA FUI	4	2023	4	2023
ERCA FUI	4	2023	4	2023
ERCA System of Systems (SoS) OA	1	2024	4	2024
UMR	4	2024	4	2024
Full Materiel Release (FMR) Supercharge	1	2022	1	2022
Engineering Manufacturing & Development (EMD)	2	2022	4	2025
Propellant Optimization	2	2022	4	2024
Propellant PDR	3	2023	3	2023
Propellant CDR	4	2024	4	2024
Charge Design	2	2022	3	2025
Charge Design PDR	4	2024	4	2024
Charge Design CDR	3	2025	3	2025
Qualification Testing	1	2026	1	2028
FMR	1	2028	1	2028

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev					Project (Number/Name) BY1 / Next Generation Combat Vehicle Ammunition		
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
BY1: Next Generation Combat Vehicle Ammunition	-	22.176	33.867	33.778	-	33.778	34.747	6.547	-	-	0.000	131.115
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The total cost of the Next Generation Combat Vehicle Ammunition (NGCV) Middle Tier of Acquisition effort is \$262.9 million from FY2019 to FY2027, including RDT&E (\$128.337M) and Procurement (\$134.532M). NGCV RDT&E and Procurement are fully funded across the Future Years Defense Program (FY2023-2027).

A. Mission Description and Budget Item Justification

50x228 millimeter (mm) family of ammunition is a critical technology development in response to the Next Generation Combat Vehicle (NGCV) Abbreviated Capability Development Document for weapon qualification, platform integration, and fielding of the Optionally Manned Fighting Vehicle (OMFV) primary weapon system (XM913). This effort includes the development of three capabilities: The XM1202 Target Practice with Trace (TP-T); the XM1203 Armor Piercing Fin Stabilized Discarding Sabot with Trace (APFSDS-T); and the XM1204 High Explosive Airburst with Trace (HEAB-T). The training cartridge will allow the Warfighter to train in a cost effective manner and the tactical cartridges will provide enhanced lethality at increased ranges when engaging personnel threats in the open, defilade, and under the cover of urban structures, Anti-Tank Guided Missiles (ATGM) teams, and current and projected future peer armored materiel threats. This effort is operating under Middle Tier Acquisition authority for rapid prototyping to qualify the three munitions in order to support the NGCV Cross Functional Team (CFT) timeline for First Unit Equipped (FUE). Fiscal Year (FY) 2023 funding will support Design Engineering Test (DET) 2 for HEAB-T performance as well as Developmental Test and Evaluation (DT&E) for TP-T and APFSDS-T cartridges.

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

	FY 2021	FY 2022	FY 2023
Title: 50x228mm Ammunition Development	22.176	32.631	33.778
Description: Qualify 50mm Target Practice with Trace (TP-T), Armor Piercing Fin-Stabilized Discarding Sabot with Trace (APFSDS-T), and High Explosive Airburst with Trace (HEAB-T) ammunition through the rapid prototyping phase.			
FY 2022 Plans: Funding will support DET for all three cartridge types and subsequent design optimization. The TP-T cartridge will undergo Critical Design Review (CDR) and subsequent component procurement and cartridge assembly for Developmental Test & Evaluation (DT&E). HEAB-T fuze testing will lead to design maturation and components procurement for follow-on tests.			
FY 2023 Plans: Funding will support DET2 for the APFSDS-T and HEAB-T cartridges for performance testing for support of CDR. Funding will also support the Developmental Test and Evaluation (DT&E) for the TP-T and APFSDS-T cartridges in support of Milestone C.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) BY1 / Next Generation Combat Vehicle Ammunition
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Increase in funding is planned lifecycle of the program and continues activities on all three cartridges in support of Milestone C.			
Title: Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR)	-	1.236	-
FY 2022 Plans: FY 2022 funding to be assessed per SBIR Title 15 USC ?638(f)(1) and STTR Title 15 USC ?638(f)(1)(A).			
FY 2022 to FY 2023 Increase/Decrease Statement: Allocation of FY 2022 SBIR/STTR was added. FY 2023 SBIR/STTR transfer amount will be determined and assessed in FY 2023.			
Accomplishments/Planned Programs Subtotals	22.176	33.867	33.778

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2023</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>						
• E80011: Next Generation Combat Vehicle Ammunition	-	-	0.000	-	0.000	28.718	20.479	43.258	47.199	0.000	139.654

Remarks

D. Acquisition Strategy
 Department of Defense Ordnance and Technology Consortium (DOTC) Other Transaction Agreements (OTAs) will be used for rapid prototyping on the three 50 x 228mm ammunition variants: TP-T, APFSDS-T, and HEAB-T. This will consist of Design Engineering Testing (DET), technical reviews, and Developmental Test and Evaluation (DT&E). For APFSDS-T, one contractor was awarded and will complete the rapid prototyping process. For TP-T two contractors were awarded and will complete rapid prototyping process. For HEAB-T, two contractors were awarded rapid prototyping agreements and a down selection decision will be made in FY 2023; then one HEAB-T contractor will complete the rapid prototyping process. The DOTC agreements will conclude upon achieving Milestone C for each cartridge: TP-T and APFSDS-T in FY 2024; and HEAB-T in FY 2025.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				BY1 / Next Generation Combat Vehicle Ammunition							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
SBIR/STTR Transfer	TBD	various : various	-	-		1.236	Mar 2022	-		-		-	0.000	1.236	-
Subtotal			-	-		1.236		-		-		-	0.000	1.236	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
50x228mm APFSDS-T Ammunition Development & Test Evaluation Hardware Contract	C/CPFF	General Dynamics Ordnance and Tactical Systems (GDOTS) : Marion, Illinois	-	2.000	Mar 2021	4.422	May 2022	0.412	Mar 2023	-		0.412	Continuing	Continuing	Continuing
50x228mm TP-T Ammunition Development & Test Evaluation Hardware Contract	C/CPFF	General Dynamics Ordnance and Tactical Systems : Marion, Illinois	-	1.000	Mar 2021	2.194	Mar 2022	0.092	Mar 2023	-		0.092	Continuing	Continuing	Continuing
50x228mm TP-T Ammunition Development & Test Evaluation Hardware Contract	C/CPFF	Northrop Grumman Innovation Systems (NGIS) : Plymouth, MN	-	1.000	Mar 2021	2.194	Mar 2022	0.240	Mar 2023	-		0.240	Continuing	Continuing	Continuing
50x228mm HEAB-T Ammunition Design Engineering Test Hardware Contract	C/CPFF	General Dynamics Ordnance and Tactical Systems : Marion, Illinois	-	5.989	Mar 2021	9.621	Jan 2022	12.005	Mar 2023	-		12.005	Continuing	Continuing	Continuing
50x228mm HEAB-T Ammunition Design Engineering Test Hardware Contract	C/CPFF	Northrop Grumman Innovation Systems (NGIS) : Plymouth, MN	-	5.989	Mar 2021	9.621	Jan 2022	12.005	Mar 2023	-		12.005	Continuing	Continuing	Continuing
Subtotal			-	15.978		28.052		24.754		-		24.754	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) BY1 / Next Generation Combat Vehicle Ammunition
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Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
50x228mm Ammo Engineering Support	MIPR	Development Command - Armaments Center (DEVCOM - AC) : Picatinny Arsenal, NJ	-	2.498	Dec 2020	3.080	Dec 2021	2.840	Dec 2022	-		2.840	Continuing	Continuing	Continuing
Subtotal			-	2.498		3.080		2.840		-		2.840	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
50x228mm Design Engineering Testing	MIPR	Aberdeen Proving Ground (APG) : Aberdeen, MD	-	3.700	Jan 2021	1.499	Dec 2021	2.000	Dec 2022	-		2.000	Continuing	Continuing	Continuing
50x228mm Design Engineering Testing	MIPR	Yuma Proving Ground (YPG) : Yuma, AZ	-	-		-		1.184	Feb 2023	-		1.184	Continuing	Continuing	Continuing
50x228mm Developmental Test and Evaluation (DT&E)	MIPR	Aberdeen Proving Ground (APG) : Aberdeen, MD	-	-		-		3.000	Apr 2023	-		3.000	Continuing	Continuing	Continuing
Subtotal			-	3.700		1.499		6.184		-		6.184	Continuing	Continuing	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	22.176	33.867	33.778	-	33.778	Continuing	Continuing	N/A

Remarks

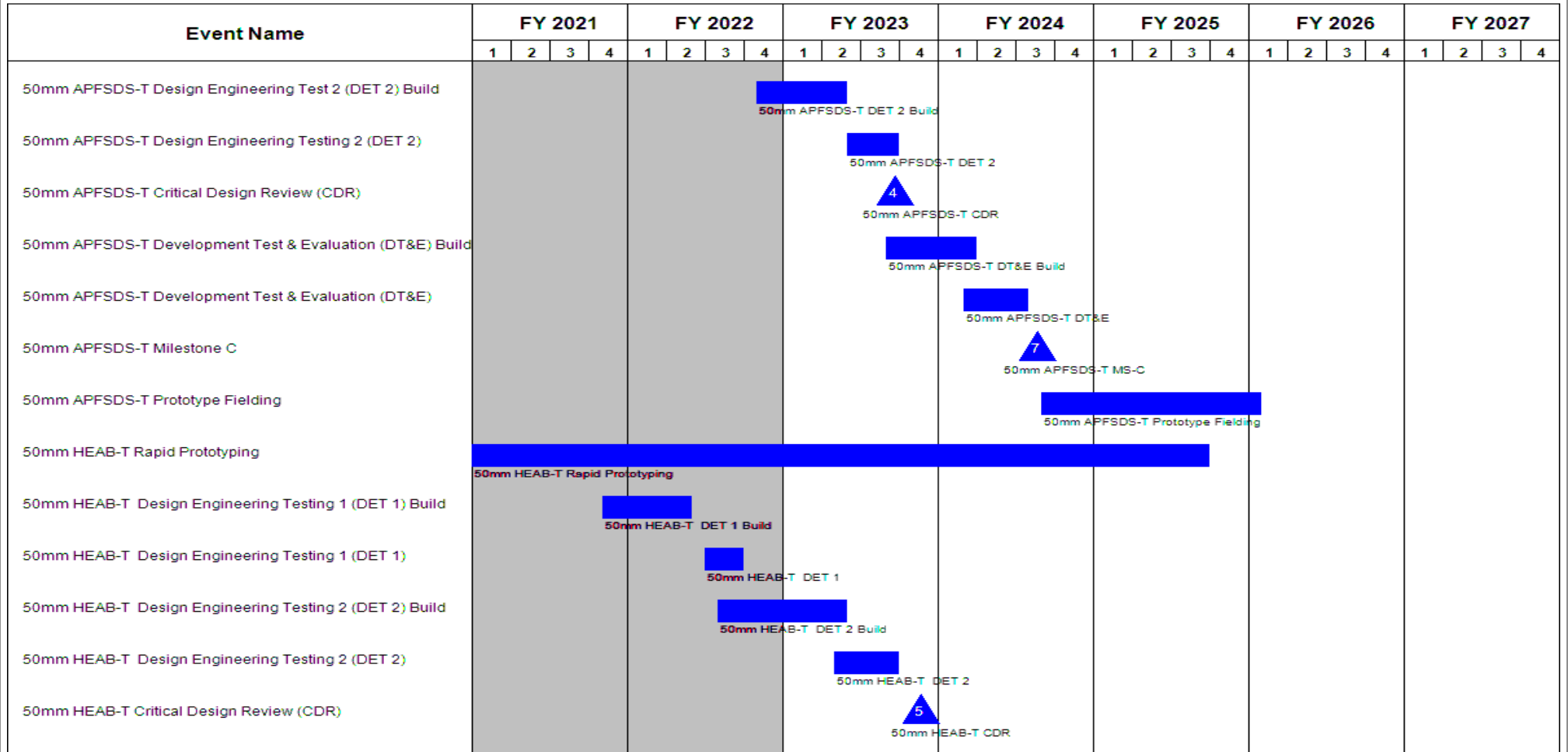
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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) BY1 / Next Generation Combat Vehicle Ammunition

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
50mm TP-T Rapid Prototyping Award	▲ 1																											
50mm TP-T Rapid Prototyping																												
50mm TP-T Design Engineering Test (DET) Build																												
50mm TP-T Design Engineering Test (DET)																												
50mm TP-T Critical Design Review (CDR)																												
50mm TP-T Development Test & Evaluation (DT&E) Build																												
50mm TP-T Development Test & Evaluation (DT&E)																												
50mm TP-T Milestone C																												
50mm TP-T Prototype Fielding																												
50mm APFSDS-T Rapid Prototyping Award																												
50mm APFSDS-T Rapid Prototyping																												
50mm APFSDS-T Design Engineering Test 1 (DET 1) Build																												
50mm APFSDS-T Design Engineering Testing 1 (DET 1)																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) BY1 / Next Generation Combat Vehicle Ammunition



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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) BY1 / <i>Next Generation Combat Vehicle Ammunition</i>

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	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				
50mm HEAB-T Development Test & Evaluation (DT&E) Build													██████████ 50mm HEAB-T DT&E Build																			
50mm HEAB-T Development Test & Evaluation (DT&E)																	██████████ 50mm HEAB-T DT&E															
50mm HEAB-T Milestone C																					▲ 50mm HEAB-T MS-C											
50mm HEAB-T Prototype Fielding																					████████████████████ 50mm HEAB-T Prototype Fielding											

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) BY1 / <i>Next Generation Combat Vehicle Ammunition</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
50mm TP-T Rapid Prototyping Award	1	2021	1	2021
50mm TP-T Rapid Prototyping	1	2021	2	2024
50mm TP-T Design Engineering Test (DET) Build	3	2021	1	2022
50mm TP-T Design Engineering Test (DET)	1	2022	2	2022
50mm TP-T Critical Design Review (CDR)	2	2022	2	2022
50mm TP-T Development Test & Evaluation (DT&E) Build	2	2022	1	2023
50mm TP-T Development Test & Evaluation (DT&E)	2	2023	3	2023
50mm TP-T Milestone C	2	2024	2	2024
50mm TP-T Prototype Fielding	2	2024	4	2025
50mm APFSDS-T Rapid Prototyping Award	2	2021	2	2021
50mm APFSDS-T Rapid Prototyping	2	2021	3	2024
50mm APFSDS-T Design Engineering Test 1 (DET 1) Build	3	2021	2	2022
50mm APFSDS-T Design Engineering Testing 1 (DET 1)	3	2022	4	2022
50mm APFSDS-T Design Engineering Test 2 (DET 2) Build	4	2022	2	2023
50mm APFSDS-T Design Engineering Testing 2 (DET 2)	2	2023	3	2023
50mm APFSDS-T Critical Design Review (CDR)	3	2023	3	2023
50mm APFSDS-T Development Test & Evaluation (DT&E) Build	3	2023	1	2024
50mm APFSDS-T Development Test & Evaluation (DT&E)	1	2024	3	2024
50mm APFSDS-T Milestone C	3	2024	3	2024
50mm APFSDS-T Prototype Fielding	3	2024	1	2026
50mm HEAB-T Rapid Prototyping Award	4	2020	4	2020
50mm HEAB-T Rapid Prototyping	4	2020	3	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) BY1 / <i>Next Generation Combat Vehicle Ammunition</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
50mm HEAB-T Design Engineering Testing 1 (DET 1) Build	4	2021	2	2022
50mm HEAB-T Design Engineering Testing 1 (DET 1)	3	2022	3	2022
50mm HEAB-T Design Engineering Testing 2 (DET 2) Build	3	2022	2	2023
50mm HEAB-T Design Engineering Testing 2 (DET 2)	2	2023	3	2023
50mm HEAB-T Critical Design Review (CDR)	4	2023	4	2023
50mm HEAB-T Development Test & Evaluation (DT&E) Build	1	2024	4	2024
50mm HEAB-T Development Test & Evaluation (DT&E)	4	2024	2	2025
50mm HEAB-T Milestone C	4	2025	4	2025
50mm HEAB-T Prototype Fielding	4	2025	1	2027

Note

- Notes:
- Target Practice with Trace (TP-T)
 - Armor-Piercing Fin-Stabilized Discarding Sabot with Trace (APFSDS-T)
 - High Explosive Airburst with trace (HEAB-T)

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) CE3 / Precision Munition (Sniper)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
CE3: Precision Munition (Sniper)	-	-	9.275	5.182	-	5.182	-	-	-	-	0.000	14.457
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Precision Munition (Sniper) project is a critical technology development in response to the Precision Munition Capabilities Development Documents (CDD) for the ammunition required to support the Precision Sniper Rifle (PSR) / sniper weapons systems. The objective is to transfer the latest lethality technology into the suite of ammunition used by snipers. The Precision Munition improvement is split into three capability areas: Anti-Materiel (AM), Improved Performance Round (IPR), and Subsonic. The AM and IPR capabilities will enhance lethal effects at greater distances. The Subsonic capability will increase soldier survivability at close range by providing a low-sound signature munition that is undetectable to the enemy. Fiscal Year (FY) 2023 funding supports development of the AM munitions, evaluation of ammunition prototypes/concepts, and prototype build and testing. FY 2023 also supports evaluating industry/Government Subsonic and IPR munitions solutions.

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

	FY 2021	FY 2022	FY 2023
<p>Title: Develop and Improve Ammunition for Sniper Weapons Systems.</p> <p>Description: Develop, demonstrate, and qualify new sniper ammunition to defeat hard targets for the Precision Sniper Rifle (PSR) and other sniper weapons systems. Integrate latest lethality technology into the current suite of sniper ammunition for the Precision Sniper Rifle (PSR) and other sniper weapons systems. Integrate latest lethality technology into the current subsonic ammunition for the Precision Sniper Rifle (PSR) and other sniper weapons systems.</p> <p>FY 2022 Plans: Commence development of the Anti-Materiel munitions; manufacture and evaluate prototype ammunition concepts. Commence development of the IPR munitions; manufacture and mature prototype ammunition designs. Evaluate and mature industry Subsonic Munitions prototype solutions and conduct safety testing.</p> <p>FY 2023 Plans: Continue development of the Anti-Materiel (AM) munitions; manufacture and evaluate prototype AM concepts. Continue evaluating and maturing industry and/or Government Subsonic Munitions and IPR prototype solutions.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 decrease in funding is due to a focus on AM round prototype and test.</p>	-	8.936	5.182
<p>Title: Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR)</p> <p>FY 2022 Plans:</p>	-	0.339	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) CE3 / Precision Munition (Sniper)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 funding to be assess per SBIR Title 15 USC ?638(f)(1) and STTR Title 15 USC ?638(f)(1)(A).			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> Allocation of FY 2022 SBIR/STTR was added. FY 2023 SBIR/STTR transfer amount will be determined and assessed in FY 2023.			
Accomplishments/Planned Programs Subtotals	-	9.275	5.182

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

N/A

Remarks

D. Acquisition Strategy

The Precision Munition (Sniper) will utilize Other Transaction Authority (OTA) to acquire and/or mature current industry designs. Contracts to acquire parts and raw materials will be competitive. The Government will prototype and test projectiles.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				CE3 / Precision Munition (Sniper)							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
SBIR/STTR Transfer	TBD	various : various	-	-		0.339		-		-		-	0.000	0.339	-
Subtotal			-	-		0.339		-		-		-	0.000	0.339	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Anti-Materiel Development Contracts	C/CPFF	To Be Determined : To Be Determined	-	-		3.336	Jun 2022	2.382	Feb 2023	-		2.382	Continuing	Continuing	Continuing
Improved Performance Round Development Contracts	C/CPFF	To Be Determined : To Be Determined	-	-		0.500	Jun 2022	-		-		-	Continuing	Continuing	Continuing
Subsonic Development Contracts	C/CPFF	To Be Determined : To Be Determined	-	-		0.500	Jun 2022	-		-		-	Continuing	Continuing	Continuing
Subtotal			-	-		4.336		2.382		-		2.382	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Anti-Materiel Support	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	-	-		1.600	May 2022	2.100	Oct 2022	-		2.100	Continuing	Continuing	Continuing
Improved Performance Round Support	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	-	-		0.500	May 2022	0.100	Oct 2022	-		0.100	Continuing	Continuing	Continuing

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) CE3 / <i>Precision Munition (Sniper)</i>

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027									
	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						
Matériel Development Decision					▲ 1 MDD																													
Anti-Matériel (AM) Munitions Rapid Development and Fielding					AM Rapid Development and Fielding																													
Anti-Matériel (AM) Munitions Prototype Build and Test					AM Prototype Build and Test																													
Improved Performance Round (IPR) Design Evaluations					IPR Design Evaluations																													
Subsonic Engineering Study					Subsonic Eng Study																													

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) CE3 / Precision Munition (Sniper)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Matériel Development Decision	2	2022	2	2022
Anti-Matériel (AM) Munitions Rapid Development and Fielding	2	2022	2	2023
Anti-Matériel (AM) Munitions Prototype Build and Test	2	2023	4	2023
Improved Performance Round (IPR) Design Evaluations	2	2022	4	2023
Subsonic Engineering Study	2	2022	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EC4 / Non-Standard Simulator Munitions			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EC4: Non-Standard Simulator Munitions	-	2.154	2.116	2.182	-	2.182	2.178	0.408	0.409	0.413	0.000	9.860
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project EC4 Non-Standard Simulator Munitions will standardize various pyrotechnics that simulate battlefield effects. The Army's Combat Training Centers (CTCs) are currently using non-standard munitions to replicate both conventional and asymmetric warfare battlefield effects. These modified commercial-off-the-shelf products have not been type classified or material released and are not safe or sustainable for use by Soldiers. This effort will develop and demonstrate various pyrotechnics/simulators to replicate both conventional and asymmetric warfare battlefield effects such as: Black smoke signature (burning vehicles, buildings, and equipment); Yellow smoke signature (chemical, biological or nuclear effects); Mini Blast to simulate hostile fire and small Improvised Explosive Devices (IEDs) during mounted operations in urban terrain; Micro pyrotechnics to simulate indoor hostile fire and IED effects that are capable of being integrated into existing facilities; Rocket Propelled Grenade (RPG) simulators to replicate the flight of a Rocket Propelled Grenade; Macro Pyro to simulate hostile fire, booby trap and IED Simulations indoor and outdoors; High Order Blast Effect (HiOBE) used to replicate a Vehicle Borne Improvised Explosive Device (VBIED), building explosions, and other significant explosive events; Artillery airburst simulator to replicate indirect fire; Antitank Guided Missile and Rocket (AGMR) simulator to replicate surface to air missile or shoulder launched rocket; Tracer Fire-back simulator to replicate enemy small arms fire and anti-aircraft fire. Standardization will reduce training costs, eliminate redundancies between systems and mitigate environmental concerns and safety risks associated with realistic scenario based training. FY 2023 funding will support the development of Yellow Smoke, RPG on a wire, Mini Blast, Tracer, and HiOBE.

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

	FY 2021	FY 2022	FY 2023
Title: Standardize Special Use Ammunition	2.154	2.038	2.182
Description: Standardize non-standard pyrotechnic battlefield effects currently used by CTCs.			
FY 2022 Plans: This project will support Engineering and Manufacturing Development (EMD) activities for Yellow Smoke, RPG on a Wire, and Mini Blast pyrotechnics and will begin technology maturation support for the Tracer and High Order Blast Effect (HiOBE) simulators.			
FY 2023 Plans: This project will support Yellow Smoke and Mini Blast preparations to release the TC and FMR package. RPG will conduct qualification testing. The Tracer will be undergoing testing support activities and the HIOBE will continue EMD activities.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EC4 / Non-Standard Simulator Munitions
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Funding increase due to increased qualification testing requirements.			
Title: FY22 SBIR/STTR Transfer	-	0.078	-
FY 2022 Plans: Funding transferred in accordance with Title 15 USC 7638			
FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 7638			
Accomplishments/Planned Programs Subtotals	2.154	2.116	2.182

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• E88404: SIMULATORS, Non-Standard, Special Effects, f/CTCs	-	0.108	0.296	-	0.296	0.296	0.297	0.296	0.297	0.000	1.590

Remarks

D. Acquisition Strategy
The Acquisition strategy is to incrementally develop and field a family of special use ammunition. Initial special use ammunition to be fielded will be the Artillery Airburst/Antitank Guided Missile and Rocket (AGMR), and Black Smoke simulators followed by additional training simulators as required in the Future Army System of Integrated Targets (FASIT) Capability Production Document (CPD).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EC4 / Non-Standard Simulator Munitions								
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
FY22 SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.078		-		-		-	0.000	0.078	-	
Subtotal			-	-		0.078		-		-		-	0.000	0.078	N/A	
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
HiOBE Developmental Hardware	C/FFP	TBD : TBD	-	-		-		0.015	Jun 2023	-		0.015	0.000	0.015	-	
Tracer Qualification Hardware	C/FFP	SAIC : Reston, VA	-	-		0.418	Apr 2022	0.591	Mar 2023	-		0.591	0.000	1.009	-	
RPG/Mini Blast Prototype Build	C/FFP	SAIC : Reston, VA	-	0.365	Jan 2022	-		-		-		-	0.000	0.365	-	
Yellow Smoke Qualification Hardware	C/FFP	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.776	Jul 2021	-		-		-		-	0.000	0.776	-	
Plastic Mold Development	C/FFP	Augustine Die & Mold : Somerset, PA	-	0.434	Dec 2021	-		-		-		-	0.000	0.434	-	
Product Development	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	3.506	-		-		-		-		-	Continuing	Continuing	-	
Subtotal			3.506	1.575		0.418		0.606		-		0.606	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	DEVCOM Armaments Center : Picatinny Arsenal, NJ	3.791	0.404	Mar 2021	1.245	May 2022	1.219	Oct 2022	-		1.219	Continuing	Continuing	-	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EC4 / Non-Standard Simulator Munitions
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Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
EOD Publication Support	MIPR	Naval Surface Warfare Center : Indian Head, MD	-	0.042	Apr 2021	-		-		-		-	0.000	0.042	-
Engineering Support	MIPR	DEVCOM Data and Analysis Center (DAC) : Aberdeen Proving Ground, MD	0.024	-		-		-		-		-	0.000	0.024	-
Document Development Support	SS/FFP	Booz Allen Hamilton : Picatinny Arsenal, NJ	-	0.133	Apr 2021	-		-		-		-	0.000	0.133	-
Subtotal			3.815	0.579		1.245		1.219		-		1.219	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Tracer EMQ Qualification	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	-		-		0.057	Jul 2023	-		0.057	0.000	0.057	-
RPG on a Wire Qualification Testing	MIPR	Naval Surface Warfare Center : Dahlgren, VA	-	-		-		0.300	May 2022	-		0.300	0.000	0.300	-
Mini Blast Qualification Testing	MIPR	Naval Surface Warfare Center : Dahlgren, VA	-	-		0.300	Sep 2022	-		-		-	0.000	0.300	-
Yellow Smoke Qualification Testing	MIPR	Naval Surface Warfare Center : Dahlgren, VA	-	-		0.075	Sep 2022	-		-		-	0.000	0.075	-
Subtotal			-	-		0.375		0.357		-		0.357	0.000	0.732	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EC4 / Non-Standard Simulator Munitions

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Artillery Airburst and Antitank Guided Missile and Rocket (AGMR)																												
Artillery Airburst and AGMR Tech Data Validation																												
Artillery and AGMR Type Classification																												
Artillery and AGMR Production																												
Black Smoke																												
Black Smoke Technology Development and Maturation																												
Black Smoke Milestone C																												
Black Smoke Production																												
Yellow Smoke																												
Yellow Smoke Technology Development																												
Yellow Smoke Milestone B																												
Yellow Smoke Engineering and Manufacturing Development																												
Yellow Smoke Milestone C																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EC4 / Non-Standard Simulator Munitions

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Yellow Smoke Production									Yellow Smoke Production																			
RPG																												
RPG Technology Development	RPG Tech Development																											
RPG Milestone B					9 RPG MS-B																							
RPG Engineering and Manufacturing Development					RPG EMD																							
RPG Milestone C													16 RPG MS-C															
RPG Production													RPG Production															
Mini Blast																												
Mini Blast Technology Development	Mini Blast Tech Development																											
Mini Blast Milestone B					10 Mini Blast MS-B																							
Mini Blast Engineering and Manufacturing Development					Mini Blast EMD																							
Mini Blast Milestone C													17 Mini Blast MS-C															
Mini Blast Production													Mini Blast Production															





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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EC4 / Non-Standard Simulator Munitions

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Tracer	<p>The Tracer program schedule shows: <ul style="list-style-type: none"> Tracer Tech Development: FY 2022 (Q1-Q4) Tracer MS-B: FY 2023 (Q1) Tracer EMD: FY 2023 (Q2-Q4) Tracer MS-C: FY 2025 (Q1) Tracer Production: FY 2025 (Q2-Q4) through FY 2027 (Q4) </p>																											
Tracer Technology Development																												
Tracer Milestone B																												
Tracer Engineering and Manufacturing Development																												
Tracer Milestone C																												
Tracer Production																												
High Order Blast Effect (HiOBE)																												
HiOBE Technology Development	<p>The HiOBE program schedule shows: <ul style="list-style-type: none"> HiOBE Tech Development: FY 2022 (Q1-Q4) HiOBE MS-B: FY 2023 (Q1) HiOBE EMD: FY 2023 (Q2-Q4) HiOBE MS-C: FY 2025 (Q1) HiOBE Production: FY 2025 (Q2-Q4) through FY 2027 (Q4) </p>																											
HiOBE Milestone B																												
HiOBE Engineering and Manufacturing Development																												
HiOBE Milestone C																												
HiOBE Production																												
Micro Pyro																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EC4 / Non-Standard Simulator Munitions

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	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				
Micro Pyro Technology Development																					 Micro Pyro Tech Development											
Micro Pyro Milestone B																									 Micro Pyro MS-B							
Micro Pyro Engineering and Manufacturing Development																									 Micro Pyro EMD							
Micro Pyro Milestone C																													 Micro Pyro MS-C			
Micro Pyro Production																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EC4 / Non-Standard Simulator Munitions

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Artillery Airburst and Antitank Guided Missile and Rocket (AGMR)	4	2021	4	2021
Artillery Airburst and AGMR Tech Data Validation	4	2019	4	2021
Artillery and AGMR Type Classification	4	2021	4	2021
Artillery and AGMR Production	4	2021	4	2028
Black Smoke	4	2021	4	2021
Black Smoke Technology Development and Maturation	4	2019	1	2022
Black Smoke Milestone C	1	2022	1	2022
Black Smoke Production	1	2022	4	2027
Yellow Smoke	4	2021	4	2021
Yellow Smoke Technology Development	2	2020	2	2022
Yellow Smoke Milestone B	2	2022	2	2022
Yellow Smoke Engineering and Manufacturing Development	2	2022	2	2023
Yellow Smoke Milestone C	2	2023	2	2023
Yellow Smoke Production	2	2023	4	2027
RPG	4	2021	4	2021
RPG Technology Development	2	2020	2	2022
RPG Milestone B	2	2022	2	2022
RPG Engineering and Manufacturing Development	2	2022	2	2024
RPG Milestone C	2	2024	2	2024
RPG Production	2	2024	4	2028
Mini Blast	4	2021	4	2021
Mini Blast Technology Development	2	2020	2	2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EC4 / Non-Standard Simulator Munitions
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Events	Start		End	
	Quarter	Year	Quarter	Year
Mini Blast Milestone B	2	2022	2	2022
Mini Blast Engineering and Manufacturing Development	2	2022	2	2024
Mini Blast Milestone C	2	2024	2	2024
Mini Blast Production	2	2024	4	2028
Tracer	4	2022	4	2022
Tracer Technology Development	2	2022	1	2023
Tracer Milestone B	1	2023	1	2023
Tracer Engineering and Manufacturing Development	1	2023	1	2025
Tracer Milestone C	1	2025	1	2025
Tracer Production	1	2025	1	2031
High Order Blast Effect (HiOBE)	4	2022	4	2022
HiOBE Technology Development	2	2022	1	2023
HiOBE Milestone B	1	2023	1	2023
HiOBE Engineering and Manufacturing Development	1	2023	3	2025
HiOBE Milestone C	3	2025	3	2025
HiOBE Production	3	2025	4	2030
Micro Pyro	1	2026	1	2026
Micro Pyro Technology Development	2	2025	1	2026
Micro Pyro Milestone B	1	2026	1	2026
Micro Pyro Engineering and Manufacturing Development	1	2026	4	2027
Micro Pyro Milestone C	4	2027	4	2027
Micro Pyro Production	1	2028	4	2034

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EL9 / Ammunitions Logistics Prototyping			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EL9: Ammunitions Logistics Prototyping	-	1.639	0.696	1.022	-	1.022	1.047	1.066	1.067	1.077	0.000	7.614
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project EL9 Ammunitions Logistics Prototyping supports the future force by improving the distribution, management, reliability and survivability of ammunition through the advanced development, integration, and demonstration of logistics system enablers. These enablers will improve the efficiency and effectiveness of ammunition operations, to include retrograde, while reducing the logistics footprint on the battlefield. Technology areas addressed include handling, distribution, and management (strategic and tactical), prognostics, diagnostics, and asset visibility, explosives safety, and adaptive and environmentally friendly packaging and palletization. The efficient deployment and sustainment of reliable ammunition is vital to success on the battlefield. This project enhances the operational effectiveness of the ammunition logistics system to ensure the distribution of reliable ammunition to the warfighter. Fiscal Year (FY) 2023 funding will be focused on integrating commercial off the shelf and/or relatively mature technologies into ammunition resupply enablers required by the Long Range Precision Fire (LRPF) Cross Functional Team (CFT). They will be focused on ensuring that a low risk resupply process solution exists to support the success of the Extended Range Canon Artillery (ERCA).

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

	FY 2021	FY 2022	FY 2023
Title: Munitions Survivability and Logistics Enablers	1.639	0.671	1.022
Description: This program will develop ammunition logistics systems that improve munitions survivability and logistics			
FY 2022 Plans: Assess commercial off the shelf low cost active and passive environmental sensors for applicability of integration to ammunition packaging consolidation techniques to improve transportation efficiencies through last tactical mile. Conduct qualification testing of a type II prototype next generation temperature/humidity sensor. Conduct qualification testing of alternative form factor munitions health monitoring system on multiple packaging types.			
FY 2023 Plans: Assess the JPEO A&A portfolio for transition opportunities for munitions health monitoring prototypes that have been validated to a Technical Readiness Level (TRL) 6 maturity. Mature and/or develop previously investigated prototype systems focused on tactical Cannon Artillery operations that will improve the operational availability of ammunition and associated components at the tactical edge. The systems will ensure artillery ammunition is prepared, protected, and monitored prior to use to improve the security and survivability of the ammunition supply chain.			
FY 2022 to FY 2023 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EL9 / Ammunitions Logistics Prototyping		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Funding increase due to expected Q4 FY22 availability of prototypes ready to transition to PM in FY23.				
Title: SBIR/STTR Transfer		-	0.025	-
FY 2022 Plans: Funding transferred in accordance with Title 15 USC 2638				
FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC 2638				
Accomplishments/Planned Programs Subtotals		1.639	0.696	1.022
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
The acquisition strategy is to work directly with the relevant PMs (Combat Ammunition Systems (CAS) & Self Propelled Howitzer (SPH)) to support the development of a resupply system/process to meet the needs of the Extended Range Canon Artillery (ERCA) system. The resultant capabilities will then be transitioned to the appropriate PM for further maturation and/or fielding.				

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EL9 / Ammunitions Logistics Prototyping								
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.025		-		-		-	0.000	0.025	-	
Subtotal			-	-		0.025		-		-		-	0.000	0.025	N/A	
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
Contractor	C/FFP	Karagozian & Case : Glendale, CA	1.984	0.367	Jan 2021	-		-		-		-	0.000	2.351	-	
Contractor	C/FFP	Phase IV : Boulder, CO	0.460	-		-		-		-		-	0.000	0.460	-	
Contractor	C/TBD	TBD : TBD	-	-		0.475	Jan 2022	0.822	Jan 2023	-		0.822	0.000	1.297	-	
Contractor	C/FFP	AGM : Tuscon, AZ	0.856	0.466	May 2021	-		-		-		-	0.000	1.322	-	
Contractor	C/FFP	Stevens Institute of Technology : Hoboken, NJ	0.167	0.150	Jul 2021	-		-		-		-	0.000	0.317	-	
Contractor	C/FFP	Mide Tech Corp : Woburn, MA	0.203	0.168	Jun 2021	-		-		-		-	0.000	0.371	-	
Subtotal			3.670	1.151		0.475		0.822		-		0.822	0.000	6.118	N/A	
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
Combat Capabilities Development Command, Armaments Center (CCDC, AC)	MIPR	Picatiny Arsenal : NJ	1.033	0.488	Dec 2020	0.196	Oct 2021	0.200	Mar 2023	-		0.200	0.000	1.917	-	
Subtotal			1.033	0.488		0.196		0.200		-		0.200	0.000	1.917	N/A	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army								Date: April 2022					
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EL9 / Ammunitions Logistics Prototyping					
	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4.703	1.639		0.696		1.022		-		1.022	0.000	8.060	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EL9 / Ammunitions Logistics Prototyping

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
System Development - Munitions Health Monitoring System (RR																												
System Development - Next Generation Temperature/Humidity																												
System Development - Tactical Munitions Monitoring																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EL9 / Ammunitions Logistics Prototyping

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
System Development - Munitions Health Monitoring System (RRAPDS)	2	2018	4	2021
System Development - Next Generation Temperature/Humidity Sensor	3	2020	4	2021
System Development - Tactical Munitions Monitoring	1	2022	4	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EP2 / Shoulder-Launched Munitions			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EP2: <i>Shoulder-Launched Munitions</i>	-	10.011	0.987	-	-	-	-	-	-	-	0.000	10.998
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Individual Assault Munition (IAM) system consists of the tactical XM919 and training devices including the XM922 sub-caliber trainer. The XM919 IAM will be a lightweight Shoulder Launched Munition (SLM) capability for combat units at the individual Soldier level. The IAM training devices including the XM922 sub-caliber trainer provide training capability that will increase the Soldier's proficiency and integration of the XM919 tactical system into combat operations. As the next generation SLM, the solution will fit within the Soldier Lethality Modernization Priority, by reducing Soldier load, while providing tactical innovation capable of extending overmatch against near-peer adversaries in a joint, multi-domain, high-intensity conflict. The tactical XM919 IAM will allow Soldiers to conduct Urban Operations and will allow Soldiers to defeat adversaries protected by field expedient structures and light armored vehicles while providing behind the wall lethality effects. This solution will be effective day or night with the ability to safely engage targets from within enclosures, increasing Soldier survivability. This solution will combine the capabilities of the existing Bunker Defeat Munition (BDM) and the AT4 Confined Space - Reduced Sensitivity (AT4CS-RS), which will reduce the logistics burden of having to maintain and train multiple systems. The Individual Assault Munition Capabilities Development Document (CDD) was approved on 11 March 2016.

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

	FY 2021	FY 2022	FY 2023
Title: XM919 Individual Assault Munition (IAM)	10.011	0.951	-
Description: The XM919 IAM program entered the Engineering and Manufacturing Development (EMD) Phase (MDD approved in 3QFY2020) and awarded multiple 10 US Code (U.S.C.) 2373 "Procurement for Experimentation Purposes" contracts to obtain Shoulder Launched Munition test hardware in support of Phase 1 (System Assessment Phase). The test hardware (tactical and training) will be used to evaluate the maturity of industry solutions to inform both user requirements and the Milestone C production decision. Data gained during the System Assessment phase will be used to develop MS C acquisition documentation and support the production decision. Following production decision and the award of a competitive multi-year production contract, the XM919 IAM program will conduct a User Excursion Soldier Touch Point prior to Type Classification and Full Materiel Release.			
FY 2022 Plans: FY 2022 funding will support the completion of testing, execution of a Soldier touch point, development of test reports and documentation for contract award and Milestone C decision			
FY 2022 to FY 2023 Increase/Decrease Statement: Decrease is based on a projected decline in requirements in FY 2023.			
Title: FY22 SBIR/STTR	-	0.036	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) EP2 / <i>Shoulder-Launched Munitions</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
<i>FY 2022 Plans:</i> FY22 Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)			
<i>FY 2022 to FY 2023 Increase/Decrease Statement:</i> FY22 Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR)			
Accomplishments/Planned Programs Subtotals	10.011	0.987	-

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

N/A

Remarks

D. Acquisition Strategy

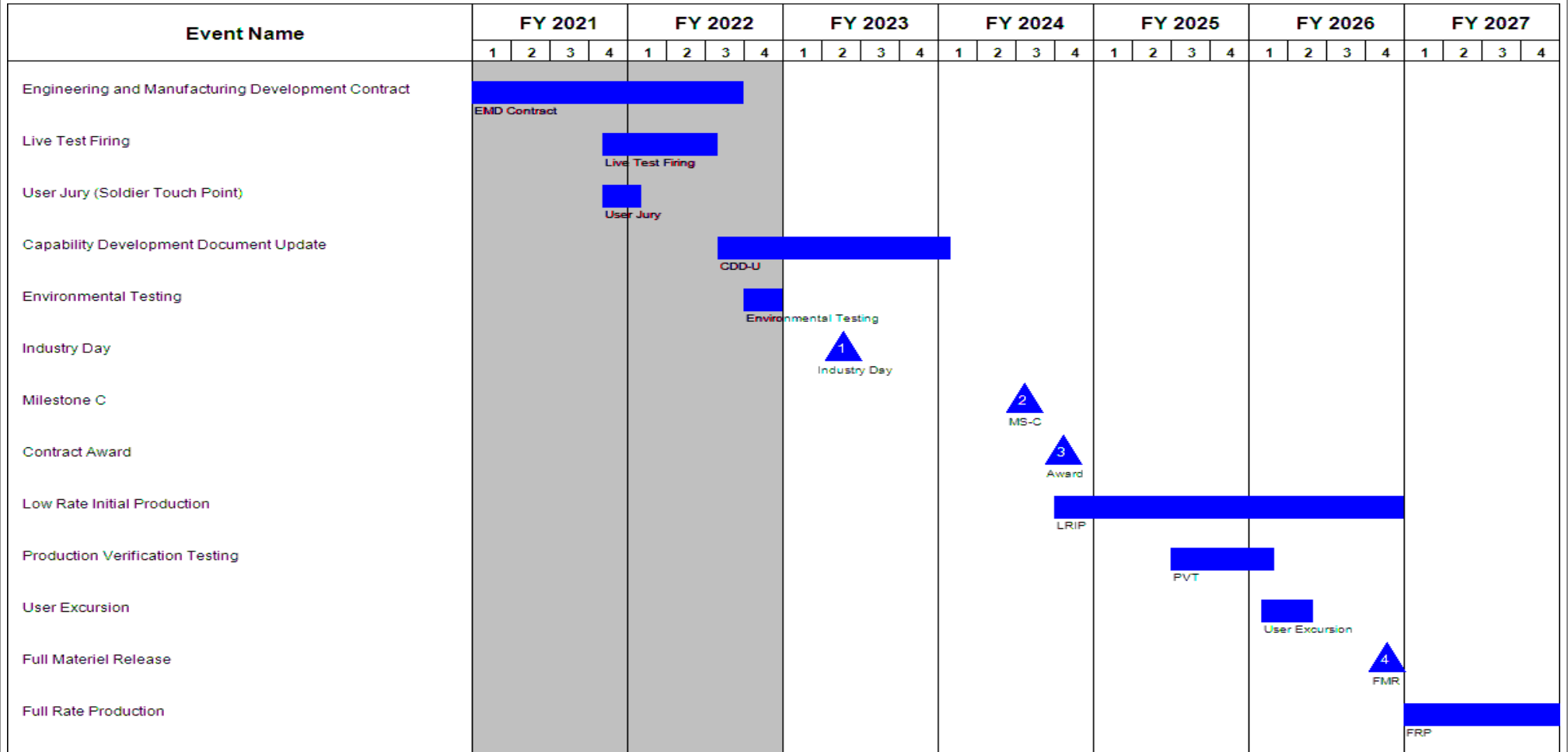
The Individual Assault Munition (IAM) acquisition strategy is a two phased approach that consists of an accelerated system assessment phase and a production phase. The system assessment phase will survey industry and assess available mature tactical and training hardware solutions through live test firings and soldier touch points to inform the IAM CDD update and a Milestone C production decision. Upon a successful production decision, the second phase will commence through a competitive multi year production contract award. The tactical XM919 IAM will replace the AT4CS-RS and BDM shoulder launched munition systems. The IAM training devices including the XM922 sub-caliber trainer will replace AT4CS-RS and BDM training devices.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EP2 / Shoulder-Launched Munitions								
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
FY22 SBIR/STTR	TBD	TBD : TBD	-	-		0.036		-		-		-	0.000	0.036	-	
Subtotal			-	-		0.036		-		-		-	0.000	0.036	N/A	
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
Individual Assault Munition (IAM) Hardware 1	C/FFP	SAAB : Stockholm, Sweden	0.593	0.571	Jan 2021	-		-		-		-	0.000	1.164	-	
Individual Assault Munition (IAM) Hardware 2	C/FFP	Dynamit Nobel Defense : Burbach, Germany	1.120	0.816	Jan 2021	-		-		-		-	0.000	1.936	-	
Individual Assault Munition (IAM) Trainer 1	C/FFP	Dynamit Nobel Defense : Burbach, Germany	-	0.193	Jun 2021	-		-		-		-	0.000	0.193	-	
Subtotal			1.713	1.580		-		-		-		-	0.000	3.293	N/A	
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
Tactical Engineering Support - Gov	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	0.890	3.239	Feb 2021	0.755	May 2022	-		-		-	0.000	4.884	-	
Trainer Engineering Support - Gov	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	0.054	Feb 2021	0.146	May 2022	-		-		-	0.000	0.200	-	
Engineering Support - Contract	C/CPFF	Booz Allen Hamilton : McLean, VA	-	0.631	Dec 2020	-		-		-		-	0.000	0.631	-	
Engineering Support - Gov	MIPR	TACOM : Warren, MI	-	0.036	Dec 2021	0.050	May 2022	-		-		-	0.000	0.086	-	
Subtotal			0.890	3.960		0.951		-		-		-	0.000	5.801	N/A	

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP2 / Shoulder-Launched Munitions



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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) EP2 / <i>Shoulder-Launched Munitions</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Individual Assault Munition (IAM) Milestone B	3	2020	3	2020
Engineering and Manufacturing Development Contract	4	2020	3	2022
Live Test Firing	4	2021	3	2022
User Jury (Soldier Touch Point)	4	2021	1	2022
Capability Development Document Update	3	2022	1	2024
Environmental Testing	4	2022	4	2022
Industry Day	2	2023	2	2023
Milestone C	3	2024	3	2024
Contract Award	4	2024	4	2024
Low Rate Initial Production	4	2024	4	2026
Production Verification Testing	3	2025	1	2026
User Excursion	1	2026	2	2026
Full Materiel Release	4	2026	4	2026
Full Rate Production	1	2027	1	2033

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EP3 / Reduced Range Ammunition - Small Caliber			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EP3: <i>Reduced Range Ammunition - Small Caliber</i>	-	13.816	11.150	5.214	-	5.214	-	-	-	-	0.000	30.180
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The small caliber Reduced Range Ammunition (RRA) Project is a critical technology development in response to the 7.62 millimeter (mm) and .50 caliber Capabilities Development Documents (CDD). The overall objective of RRA is to provide training ammunition suitable for use on military installations with Surface Danger Zone (SDZ) restrictions. The relatively long maximum range of the 7.62mm and .50 caliber service ammunition poses challenges on training ranges in range restricted areas. RRA will mitigate a training gap on installations by providing a materiel solution that meets training needs while shortening and condensing the SDZ. This will allow soldiers to train with 7.62mm and .50 caliber weapons on restricted ranges. The RRA cartridge design will be compatible with all Army 7.62mm and .50 caliber weapons, but specifically optimized to work in the M240 and M2 Machine Guns. Fiscal Year (FY) 2023 funding supports completing Engineering and Manufacturing Development (EMD) efforts, completing Production Qualification Testing (PQT), and performing activities to prepare for ammunition production transition to the Lake City Army Ammunition Plant (LCAAP) in preparation for Low-Rate Initial Production (LRIP) on the 7.62mm variant. FY 2023 also includes completing the EMD effort, complete safety release testing, conducting a Limited User Assessment (LUA) / User Evaluation, and completing PQT on the .50 caliber variant.

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

	FY 2021	FY 2022	FY 2023
<p>Title: Engineering and Manufacturing Development 7.62mm</p> <p>Description: EMD Activities for 7.62mm Reduced Range Ammunition.</p> <p>FY 2022 Plans: Complete EMD, conduct PQT, and perform activities to prepare for transition of manufacturing to the LCAAP in preparation for Low-Rate Initial Production (LRIP).</p> <p>FY 2023 Plans: Complete EMD, complete PQT, and continue performing activities to prepare for transition of manufacturing to the LCAAP in preparation for Low-Rate Initial Production (LRIP).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funds were reduced in accordance with planned EMD activities in FY 2023.</p>	5.816	6.193	1.800
<p>Title: Engineering and Manufacturing Development .50 Caliber</p> <p>Description: EMD Activities for .50 Cal Reduced Range Ammunition.</p> <p>FY 2022 Plans:</p>	8.000	4.550	3.414

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP3 / Reduced Range Ammunition - Small Caliber

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Continue the EMD effort, conduct safety release testing, conduct a LUA, and prepare for PQT. FY 2023 Plans: Complete EMD effort, complete safety release testing, complete PQT, and conduct a LUA. FY 2022 to FY 2023 Increase/Decrease Statement: Funds were reduced in accordance with planned EMD activities in FY 2023.			
Title: Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR) FY 2022 Plans: FY 2022 funding to be assess per SBIR Title 15 USC ?638(f)(1) and STTR Title 15 USC ?638(f)(1)(A). FY 2022 to FY 2023 Increase/Decrease Statement: Allocation of FY 2022 SBIR/STTR was added. FY 2023 SBIR/STTR transfer amount will be determined and assessed in FY 2023.	-	0.407	-
Accomplishments/Planned Programs Subtotals	13.816	11.150	5.214

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

N/A
Remarks

D. Acquisition Strategy

After 7.62mm Milestone (MS) B in FY 2019, the Government awarded competitive Engineering and Manufacturing Development (EMD) contracts. Upon completing Production Qualification Testing (PQT), the government will then down-select to a single contractor to complete EMD. The .50 Caliber program follows a similar strategy. The Government awarded multiple competitive contracts for the .50 Caliber EMD.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EP3 / Reduced Range Ammunition - Small Caliber							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
SBIR/STTR Transfer	TBD	various : various	-	-		0.407		-		-		-	0.000	0.407	-
Subtotal			-	-		0.407		-		-		-	0.000	0.407	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Development Contract 7.62mm EMD # 1	Option/CPFF	General Dynamics : St. Petersburg, Florida	1.916	1.500	Feb 2021	-		-		-		-	Continuing	Continuing	Continuing
Development Contract 7.62mm EMD # 2	Option/CPFF	Nammo Tally : Mesa, Arizona	1.413	1.600	Feb 2021	0.519	Jun 2022	-		-		-	Continuing	Continuing	Continuing
Development Contract 7.62mm Transition to Lake City Army Ammunition Plant (LCAAP)	Option/CPFF	OLIN Winchester Corporation : Independence, Missouri	0.509	-		1.824	Jun 2022	-		-		-	0.000	2.333	-
Development Contract .50 Cal Contractor 1	Option/CPFF	General Dynamics : General Dynamics	0.352	1.510	Mar 2021	-		0.615	Jan 2023	-		0.615	Continuing	Continuing	Continuing
Development Contract .50 cal Contractor 2	Option/CPFF	Nammo Talley : Mesa, Arizona	-	1.510	Mar 2021	-		-		-		-	0.000	1.510	-
Prototype Development	Option/CPAF	Booz Allen Hamilton : Dover, NJ	0.390	-		-		-		-		-	0.000	0.390	-
Subtotal			4.580	6.120		2.343		0.615		-		0.615	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
DEVCOM-AC Engineering Support 7.62mm	MIPR	Development Command Armaments Center (DEVCOM-AC) :	2.697	1.616	Oct 2020	0.800	Oct 2021	1.183	Oct 2022	-		1.183	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EP3 / Reduced Range Ammunition - Small Caliber							
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
		Picatinny Arsenal, New Jersey													
DEVCOM-AC Engineering Support .50 Cal	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	1.050	1.640	Nov 2020	1.400	Oct 2021	1.200	Oct 2022	-		1.200	Continuing	Continuing	Continuing
US Army Research Lab (ARL) 7.62mm	MIPR	US Army Research Lab (ARL) : Aberdeen, Maryland	0.270	0.200		0.700	Feb 2022	0.400	Oct 2022	-		0.400	Continuing	Continuing	Continuing
US Army Research Lab (ARL) .50 Cal	MIPR	US Army Research Lab (ARL) : Aberdeen, Maryland	-	0.400	Feb 2021	0.800	Feb 2022	0.301	Oct 2022	-		0.301	Continuing	Continuing	Continuing
Subtotal			4.017	3.856		3.700		3.084		-		3.084	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Design Verification Test (DVT 7.62mm)	MIPR	U.S. Army Test Center : Yuma, Arizona	0.482	-		-		-		-		-	0.000	0.482	-
Engineering Tests 7.62mm LUA	MIPR	U.S. Army Test Center : Aberdeen, Maryland	-	0.400	Oct 2020	0.600	Jun 2022	-		-		-	0.000	1.000	-
Pre-Production Qualification Testing (PPQT 7.62mm)	MIPR	Aberdeen Test Center : Aberdeen, Maryland	-	1.600	Dec 2020	-		-		-		-	Continuing	Continuing	Continuing
Production Qualification Testing (PQT 7.62mm)	MIPR	Aberdeen Test Center : Aberdeen, Maryland	-	-		1.750	Jun 2022	0.300	Nov 2022	-		0.300	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EP3 / Reduced Range Ammunition - Small Caliber							
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Pre-Production Qualification Testing (PPQT) .50 Cal	MIPR	Aberdeen Test Center : Aberdeen, Maryland	-	0.800	Nov 2020	-		-		-		-	0.000	0.800	-
User Evaluation .50 Cal	MIPR	Maneuver Battle Labs : Fort Benning, Georgia	-	0.640	Oct 2020	0.600	Jun 2022	0.415	Dec 2022	-		0.415	Continuing	Continuing	Continuing
Engineering Tests .50 Cal	MIPR	Aberdeen Test Center : Aberdeen, Maryland	0.658	0.400	Oct 2020	-		-		-		-	Continuing	Continuing	Continuing
Production Qualification Testing (PQT) .50 Cal	MIPR	Aberdeen Test Center : Aberdeen, Maryland	-	-		1.750	Jun 2022	0.800	Nov 2022	-		0.800	Continuing	Continuing	Continuing
Subtotal			1.140	3.840		4.700		1.515		-		1.515	Continuing	Continuing	N/A
Project Cost Totals			9.737	13.816		11.150		5.214		-		5.214	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP3 / Reduced Range Ammunition - Small Caliber

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	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				
7.62mm Engineering and Manufacturing Development (EMD)	[Blue bar spanning FY 2021 Q1 to FY 2023 Q4]																															
	7.62mm EMD																															
7.62mm Pre-Production Qualification Test (PPQT)	[Blue bar spanning FY 2021 Q3 to FY 2022 Q1]																															
	7.62mm PPQT																															
7.62mm Developmental Test and Evaluation (DT&E)	[Blue bar spanning FY 2021 Q3 to FY 2022 Q1]																															
	7.62mm DT&E																															
7.62mm Soldier Touch Point (STP)	[Blue bar spanning FY 2021 Q4 to FY 2022 Q1]																															
	7.62mm STP																															
7.62mm Critical Design Review (CDR)	[Blue triangle at FY 2022 Q2]																															
	7.62mm CDR																															
7.62mm Production Qualification Test (PQT)	[Blue bar spanning FY 2023 Q1 to FY 2023 Q2]																															
	7.62mm PQT																															
7.62mm Milestone C (MS C)	[Blue triangle at FY 2023 Q4]																															
	7.62mm MS C																															
.50 Caliber Engineering and Manufacturing Development (EMD)	[Blue bar spanning FY 2021 Q1 to FY 2023 Q4]																															
	.50 Cal EMD																															
.50 Caliber Preliminary Design Review (PDR)	[Blue triangle at FY 2021 Q1]																															
	.50 Cal PDR																															
.50 Caliber Pre-Production Qualification Test (PPQT)	[Blue bar spanning FY 2021 Q3 to FY 2022 Q1]																															
	.50 Cal PPQT																															
.50 Caliber Critical Design Review (CDR)	[Blue triangle at FY 2022 Q2]																															
	.50 Cal CDR																															
.50 Caliber Safety Release Testing	[Blue bar spanning FY 2023 Q1 to FY 2023 Q2]																															
	.50 Cal Safety Release Testing																															
.50 Caliber Production Qualification Test (PQT)	[Blue bar spanning FY 2023 Q1 to FY 2023 Q2]																															
	.50 Cal PQT																															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP3 / Reduced Range Ammunition - Small Caliber

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
.50 Caliber Limited User Evaluation (LUA)									■																			
.50 Caliber Milestone C (MS C)									▲																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) EP3 / <i>Reduced Range Ammunition - Small Caliber</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
7.62mm Multiple Concept Design Evaluations	1	2017	4	2018
7.62mm Materiel Development Decision (MDD)	4	2017	4	2017
7.62mm Design Verification Test (DVT)	2	2018	3	2018
7.62mm Milestone B (MS B)	1	2019	1	2019
7.62mm Transitions from BA04 EL7 to BA05 EP3	1	2019	1	2019
7.62mm Engineering and Manufacturing Development (EMD)	1	2019	2	2023
7.62mm Preliminary Design Review (PDR)	2	2020	2	2020
7.62mm Pre-Production Qualification Test (PPQT)	3	2021	1	2022
7.62mm Developmental Test and Evaluation (DT&E)	3	2021	1	2022
7.62mm Soldier Touch Point (STP)	4	2021	1	2022
7.62mm Critical Design Review (CDR)	2	2022	2	2022
7.62mm Production Qualification Test (PQT)	4	2022	2	2023
7.62mm Milestone C (MS C)	2	2023	2	2023
.50 Caliber Project Starts on BA04 EL7	1	2018	1	2018
.50 Caliber Multiple Concept Design Evaluations	1	2018	1	2020
.50 Caliber Materiel Development Decision (MDD)	2	2018	2	2018
.50 Caliber Design Verification Test (DVT)	2	2019	3	2019
.50 Caliber Milestone B (MS B)	1	2020	1	2020
.50 Caliber Transitions from BA04 EL7 to BA05 EP3	1	2020	1	2020
.50 Caliber Engineering and Manufacturing Development (EMD)	1	2020	4	2023
.50 Caliber Preliminary Design Review (PDR)	2	2021	2	2021
.50 Caliber Pre-Production Qualification Test (PPQT)	1	2021	3	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP3 / Reduced Range Ammunition - Small Caliber
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Events	Start		End	
	Quarter	Year	Quarter	Year
.50 Caliber Critical Design Review (CDR)	1	2022	1	2022
.50 Caliber Safety Release Testing	4	2022	3	2023
.50 Caliber Production Qualification Test (PQT)	4	2022	3	2023
.50 Caliber Limited User Evaluation (LUA)	2	2023	2	2023
.50 Caliber Milestone C (MS C)	4	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP4 / One-Way Luminescence for Small Caliber Ammo
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EP4: <i>One-Way Luminescence for Small Caliber Ammo</i>	-	13.467	4.896	7.565	-	7.565	3.079	-	-	-	0.000	29.007
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The One Way Luminescence (OWL) project is a critical technology development in response to the 7.62 millimeter (mm) and 5.56mm Families of Ammunition Capabilities Development Documents (CDD) and .50 Caliber Munitions CDD. Current small caliber ammunition tracer rounds are a pyrotechnic tracer mix which allows enemy forces to see the trace round and track its trajectory back to the shooter. The OWL projects objective is to develop and field a full tracer round, replace the current pyrotechnic cartridges with trace cartridges that are only visible to the shooter and soldiers in close proximity, increasing soldier survivability, and increasing lethality by incorporating Enhanced Performance Round (EPR) technology into the new tracer ammunition. 7.62mm and 5.56mm are the immediate focus; later followed by .50 Caliber cartridges and Next Generation Squad Weapons (NGSW) ammunition. Fiscal Year (FY) 2023 funding will support continuing Engineering and Manufacturing Development (EMD), performing Production Qualification Testing (PQT), conducting Live Fire Test and Evaluation (LFT&E), and performing preparation activities for manufacturing at the Lake City Army Ammunition Plant (LCAAP) in preparation for Low-Rate Initial Production (LRIP) for the 7.62mm variant. FY 2023 funding will also support EMD efforts, performing PQT, conducting LFT&E, and a Soldier Touch Point (STP) / User Evaluation for the 5.56mm variant.

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

	FY 2021	FY 2022	FY 2023
<p>Title: EMD 7.62mm</p> <p>Description: EMD efforts for the 7.62mm variant.</p> <p>FY 2023 Plans: Complete EMD efforts, perform PQT, conduct LFT&E, and perform activities to prepare for transition of manufacturing to the LCAAP in preparation for LRIP.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Congressional Mark in FY22. Planned EMD activities in FY 2023.</p>	7.100	-	1.626
<p>Title: EMD 5.56mm</p> <p>Description: EMD efforts for the 5.56mm variants.</p> <p>FY 2022 Plans: Continue EMD efforts, conduct a PDR, conduct PPQT, conduct a STP / User Evaluation, and perform activities to prepare for transition of manufacturing to the LCAAP in preparation for LRIP.</p> <p>FY 2023 Plans:</p>	6.217	4.602	5.939

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP4 / One-Way Luminescence for Small Caliber Ammo		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Continue EMD efforts, conduct PQT, conduct LFT&E, and conduct a STP / User Evaluation.				
FY 2022 to FY 2023 Increase/Decrease Statement: Planned EMD activities in FY 2023.				
Title: Prototype and Concept Evaluation for Other Small Caliber Ammunition		0.150	0.115	-
Description: Supports concept development/evaluation of applying OWL tracer solutions to other small caliber ammunition; including .50 Caliber ammunition.				
FY 2022 Plans: Will continue to assess OWL technologies for potential to adapt the technology into other small caliber ammunition variants.				
FY 2022 to FY 2023 Increase/Decrease Statement: No planned activities in FY 2023.				
Title: Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR)		-	0.179	-
FY 2022 Plans: FY 2022 funding to be assessed per SBIR Title 15 USC ?638(f)(1) and STTR Title 15 USC ?638(f)(1)(A).				
FY 2022 to FY 2023 Increase/Decrease Statement: Allocation of FY 2022 SBIR/STTR was added. FY 2023 SBIR/STTR transfer amount will be determined and assessed in FY 2023.				
Accomplishments/Planned Programs Subtotals		13.467	4.896	7.565
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
The OWL concept will be developed through Government and Industry prototyping efforts. Technology Readiness Assessments (TRAs) were conducted in FY 2017 and FY 2018 to evaluate the industry and Government concepts in order to proceed with the 7.62mm EMD. The 5.56mm, NGSW, and .50 Caliber cartridges will follow the 7.62mm schedule with EMD starting in FY 2021 for the 5.56mm variant after conducting a TRA and achieving Technology Readiness Level 6 (TRL6) in FY 2020. The new tracer cartridges will replace legacy tracers in each of the various small caliber configurations.				

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EP4 / One-Way Luminescence for Small Caliber Ammo							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.179		-		-		-	0.000	0.179	-
Subtotal			-	-		0.179		-		-		-	0.000	0.179	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 Manager Maneuver Ammunition Systems (PM MAS)	Various	Picatinny Arsenal : New Jersey	0.015	0.002	Feb 2021	-		-		-		-	0.000	0.017	-
EMD Contractor # 1 (7.62mm)	Option/CPFF	General Dynamics : St. Petersburg, FL	3.908	1.683	Jul 2021	-		-		-		-	0.000	5.591	-
EMD Contractor # 2 (7.62mm)	Option/CPFF	Nammo Tally : Mesa, AZ	3.482	1.142	Nov 2020	-		-		-		-	0.000	4.624	-
OWL Prototype Development (7.62mm)	Option/CPFF	JAK Tool Engineering Solutions : Cranbury, NJ	0.951	1.372	Nov 2020	-		-		-		-	Continuing	Continuing	Continuing
OWL Manufacturing Tooling Development (7.62mm)	Option/CPFF	JAK Tool Engineering Solutions : Cranbury, NJ	1.244	-		-		-		-		-	Continuing	Continuing	Continuing
Lake City Army Ammunition Plant Tech Integration PH II (5.56mm)	Option/FFP	OLIN Winchester Corporation : Independence, MO	-	-		1.000	Jan 2022	-		-		-	Continuing	Continuing	Continuing
OWL Manufacturing Tooling Development (5.56mm)	Option/CPFF	JAK Tool Engineering Solutions : Cranbury, NJ	-	1.571	Nov 2020	0.250	Oct 2021	-		-		-	Continuing	Continuing	Continuing
EMD PH I Contract (5.56mm)	Option/CPFF	OLIN Winchester Corporation : Independence, MO	-	3.000	Mar 2021	2.000	Oct 2021	2.800	Oct 2022	-		2.800	Continuing	Continuing	Continuing
Subtotal			9.600	8.770		3.250		2.800		-		2.800	Continuing	Continuing	N/A

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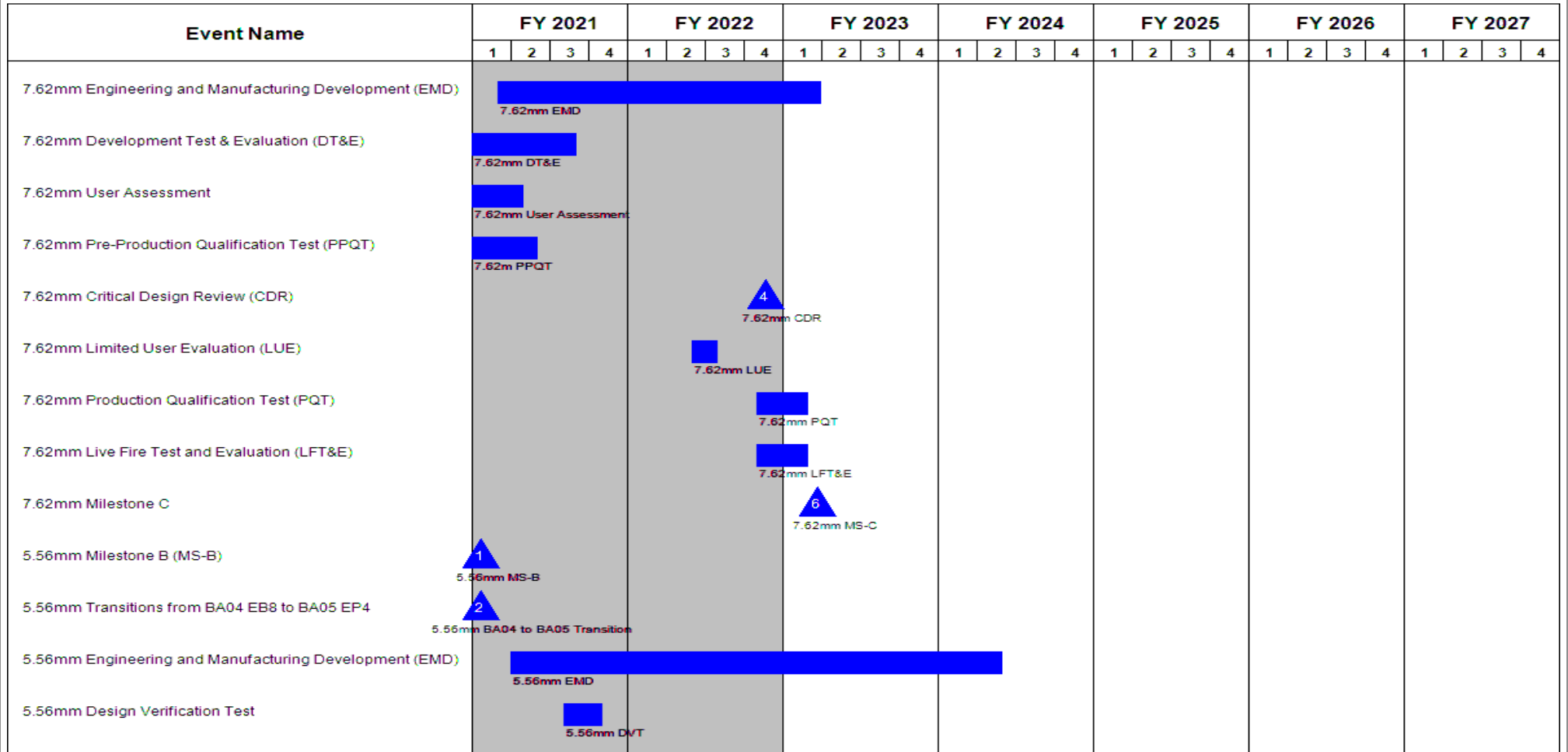
Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EP4 / One-Way Luminescence for Small Caliber Ammo							
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
DEVCOM-AC Engineering Support 7.62mm	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	2.384	2.450	Nov 2020	-		0.500	Oct 2022	-		0.500	Continuing	Continuing	Continuing
DEVCOM-AC Engineering Support 5.56mm	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	-	1.546	Nov 2020	0.721	Oct 2021	1.886	Oct 2022	-		1.886	Continuing	Continuing	Continuing
OWL Solutions/Evaluation	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	0.095	-		0.115	Oct 2021	-		-		-	Continuing	Continuing	Continuing
Subtotal			2.479	3.996		0.836		2.386		-		2.386	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
U.S. Army Aberdeen Test Center (ATC) 7.62mm	MIPR	Aberdeen Proving Ground : Maryland	0.485	0.322	May 2021	-		-		-		-	Continuing	Continuing	Continuing
Independent Testing (7.62mm)	MIPR	Joint Munitions Command/ Ballistics Services Organization : Independence, MO	0.085	-		-		-		-		-	0.000	0.085	-
Soldier Touch Point 2 (7.62mm)	MIPR	US Army Maneuver Battle Labs : Fort Benning, GA	0.180	-		-		-		-		-	0.000	0.180	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EP4 / One-Way Luminescence for Small Caliber Ammo							
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Radar Testing (7.62mm)	MIPR	US Army Research Lab : Aberdeen, MD	1.103	-		-		-		-		-	Continuing	Continuing	Continuing
Production Qualification Testing (PQT) 7.62mm	MIPR	Aberdeen Test Center : Aberdeen, MD	-	-		-		0.826	Aug 2022	-		0.826	0.000	0.826	-
Live Fire Test and Evaluation (LFT&E) 7.62mm	MIPR	Aberdeen Test Center : Aberdeen, MD	-	-		-		0.300	Aug 2022	-		0.300	0.000	0.300	-
Soft Hard Target Testing 5.56mm	MIPR	Development Command Army Research Lab (ARL) : Aberdeen, MD	-	0.225	Apr 2021	-		-		-		-	0.000	0.225	-
Safety Release Testing (5.56mm)	MIPR	Aberdeen Test Center : Aberdeen, MD	-	0.079	Jul 2021	-		-		-		-	0.000	0.079	-
Radar Testing (5.56mm)	MIPR	US Army Research Lab : Aberdeen, MD	-	0.075	Feb 2022	0.100	Nov 2021	-		-		-	Continuing	Continuing	Continuing
Pre-Production Qualification Testing (PPQT) 5.56mm	MIPR	Aberdeen Test Center : Aberdeen, MD	-	-		0.300	May 2022	-		-		-	Continuing	Continuing	Continuing
Independent Testing (5.56mm)	MIPR	Joint Munitions Command/ Ballistics Services Organization : Independence, MO	-	-		0.031	May 2022	-		-		-	Continuing	Continuing	Continuing
Soldier Touch Point 1 (5.56mm)	MIPR	US Army Maneuver Battle Labs : Fort Benning, GA	-	-		0.200	Feb 2022	-		-		-	Continuing	Continuing	Continuing
Soldier Touch Point 2 (5.56mm)	MIPR	US Army Maneuver Battle Labs : Fort Benning, GA	-	-		-		0.150	Dec 2022	-		0.150	0.000	0.150	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP4 / One-Way Luminescence for Small Caliber Ammo



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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP4 / One-Way Luminescence for Small Caliber Ammo

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
5.56mm Preliminary Design Review (PDR)					3 5.56mm PDR																							
5.56mm User Assessment / Soldier Touch Point 1 (STP 1)									5.56mm STP 1																			
5.56mm Pre-Production Qualification Test (PPQT)									5.56mm PPQT																			
5.56mm Critical Design Review (CDR)									5 5.56mm CDR																			
5.56mm Development Test & Evaluation (DT&E)									5.56mm DT&E																			
5.56mm User Assessment / Soldier Touch Point 2 (STP 2)													5.56mm STP 2															
5.56mm Production Qualification Testing (PQT)													5.56mm PQT															
5.56mm Live-Fire Test and Evaluation (LFT&E)													5.56mm LFT&E															
5.56mm Milestone C (MS-C)																	7 5.56mm MS-C											
Prototype & Concept Evaluation for Other Small Caliber Ammo					Concept Design Evaluation																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP4 / One-Way Luminescence for Small Caliber Ammo

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
7.62mm Materiel Development Decision (MDD)	4	2016	4	2016
7.62mm Multiple Concept Design Evaluation	1	2015	1	2019
7.62mm Milestone B (MS-B)	1	2019	1	2019
7.62mm Transitions from BA04 EB8 to BA05 EP4	1	2019	1	2019
7.62mm Engineering and Manufacturing Development (EMD)	1	2019	1	2023
7.62mm Design Verification Test	2	2019	3	2019
7.62mm Preliminary Design Review (PDR)	3	2019	3	2019
7.62mm Development Test & Evaluation (DT&E)	3	2020	3	2021
7.62mm User Assessment	4	2020	1	2021
7.62mm Pre-Production Qualification Test (PPQT)	4	2020	2	2021
7.62mm Critical Design Review (CDR)	4	2022	4	2022
7.62mm Limited User Evaluation (LUE)	2	2022	3	2022
7.62mm Production Qualification Test (PQT)	4	2022	1	2023
7.62mm Live Fire Test and Evaluation (LFT&E)	4	2022	1	2023
7.62mm Milestone C	1	2023	1	2023
5.56mm Materiel Development Decision (MDD)	3	2018	3	2018
5.56mm Project Starts on BA04 EB8	3	2018	3	2018
5.56mm Multiple Concept Design Evaluation	4	2018	4	2020
5.56mm Cavity Design Test	1	2020	3	2020
5.55 Technology Readiness Level 6 (TRL 6)	4	2020	4	2020
5.56mm Milestone B (MS-B)	1	2021	1	2021
5.56mm Transitions from BA04 EB8 to BA05 EP4	1	2021	1	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) EP4 / <i>One-Way Luminescence for Small Caliber Ammo</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
5.56mm Engineering and Manufacturing Development (EMD)	1	2021	2	2024
5.56mm Design Verification Test	3	2021	4	2021
5.56mm Preliminary Design Review (PDR)	1	2022	1	2022
5.56mm User Assessment / Soldier Touch Point 1 (STP 1)	4	2022	4	2022
5.56mm Pre-Production Qualification Test (PPQT)	4	2022	1	2023
5.56mm Critical Design Review (CDR)	1	2023	1	2023
5.56mm Development Test & Evaluation (DT&E)	1	2023	2	2023
5.56mm User Assessment / Soldier Touch Point 2 (STP 2)	3	2023	3	2023
5.56mm Production Qualification Testing (PQT)	3	2023	1	2024
5.56mm Live-Fire Test and Evaluation (LFT&E)	3	2023	4	2023
5.56mm Milestone C (MS-C)	2	2024	2	2024
Prototype & Concept Evaluation for Other Small Caliber Ammo	1	2020	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EP7 / Aviation Airborne Expendable Countermeasures			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EP7: Aviation Airborne Expendable Countermeasures	-	4.313	7.526	6.363	-	6.363	-	-	-	-	0.000	18.202
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project EB9 / Aviation Airborne Expendable Countermeasures within PE 0603639A / Tank and Medium Caliber Ammunitions transitions to Engineering and Manufacturing Development (EMD) under Project EP7 / Aviation Airborne Expendable Countermeasures within PE 0604802A / Weapons and Munitions - Eng Dev.

A. Mission Description and Budget Item Justification

Aviation Airborne Expendable Countermeasures (AAECM) will support Integrated System Design (ISD), System Capability (SC) and Manufacturing Process Demonstrations (MPD) on expendable countermeasure flares and decoys to include the XM215 Infrared (IR) countermeasure Flare and XM20 Radio Frequency (RF) expendables. These expendable countermeasures systems are an essential part of survivability equipment for Army aircraft. Army Research Development Technology & Evaluation (RDT&E) efforts are coordinated with Program Executive Office (PEO) Aviation to address the AAECM capability, a critical enabler for enduring aircraft and the Future Vertical Lift (FVL) - Aircraft Survivability Equipment (ASE) Cross Functional Team (CFT) within Army's Top modernization priorities.

These advanced decoys will address deficiencies in Army aircraft protection and the safety of its aircrews against advanced Man-Portable Air Defense Systems (MANPADS) and Surface-to-Air Missiles (SAM) systems. The project will also support ISD, SC and MPD on new expendable countermeasure munitions that will protect Army aircraft from advanced and proliferated current guided missile threats. Activities include modeling and simulation, flight testing, qualification testing, environmental considerations, safety enhancements, manufacturing enhancements, qualification of other service and foreign munitions that could meet current requirements, product improvements, insertion of new technologies to increase performance, and enhancement of current flare solutions for new and existing aircraft. Systems include impulse cartridges and aircraft expendables (to include RF expendables). FY 2023 will support environmental testing, developmental testing, operational testing and flight testing to support XM215 Milestone C as well as operational test and evaluation for the XM20 design.

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

	FY 2021	FY 2022	FY 2023
Title: Improvements to Countermeasure Flares	4.313	7.251	6.363
Description: This program will develop XM215 Infrared and XM20 Radio Frequency expendable countermeasure flare/decoy to defeat specific threats of interest and qualify them for Army use. This program will also develop countermeasure patterns/cocktails solutions to integrate these new expendables into Army's rotary wing and fixed wing aircraft.			
FY 2022 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP7 / Aviation Airborne Expendable Countermeasures
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 will continue development of the XM215 countermeasure and conduct developmental testing and operational testing of the final flare design. Development and flight testing for the XM20 countermeasure will continue as well. FY 2023 Plans: FY 2023 funding will support XM215 environmental testing, developmental testing, operational testing and flight testing in addition to XM20 Operational testing. FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 funding were slightly reduced due to a slight decrease in required countermeasure flight testing.			
Title: FY 2022 SBIR/STTR Transfer FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638 FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638	-	0.275	-
Accomplishments/Planned Programs Subtotals	4.313	7.526	6.363

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• EB9: Aviation Airborne Expendable Countermeasures	4.332	5.529	0.000	-	0.000	-	-	-	-	0.000	9.861
• E49101: Flare, Aircraft Countermeasure, RF (Passive)	-	-	1.036	-	1.036	-	-	-	-	0.000	1.036

Remarks
Project EB9 Aviation Airborne Expendable Countermeasures within PE 0604802A / Weapons and Munitions - Eng Dev supports the XM20 Radio Frequency (RF) AAECM capability development.

D. Acquisition Strategy
During the Materiel Solution Analysis (MSA), Milestone A phase, prototypes developed by the US Government (USG) and contractors were tested and evaluated against initial CDD requirements. The contractor developed XM20 design and the USG developed XM215 design were selected to enter into Engineering and Manufacturing Development (EMD), Milestone B phase, to finalize the design based on lessons learned from the MSA flight test and CDD requirements. The USG transitioned both designs to industry via Other Transaction Authority (OTA) contract mechanism in FY 2021. Industry prototypes will undergo Developmental and Operational Testing and final XM20 and XM215 and configurations to support Milestone C in FY 2022 and FY 2023 respectively.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EP7 / Aviation Airborne Expendable Countermeasures							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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 2022 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.275		-		-		-	0.000	0.275	-
Subtotal			-	-		0.275		-		-		-	0.000	0.275	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
XM215 Development Government	MIPR	CCDC Armaments Center : Picatinny Arsenal, NJ	1.426	0.480	Mar 2021	0.658	Mar 2022	-		-		-	0.000	2.564	-
XM215 Development Contractor 1	C/CPFF	Kilgore : Toone, TN	-	1.378	May 2021	1.396	Apr 2022	1.413	Oct 2022	-		1.413	0.000	4.187	-
Subtotal			1.426	1.858		2.054		1.413		-		1.413	0.000	6.751	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
XM215 Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	1.280	1.478	Jan 2021	1.643	Mar 2022	1.394	Oct 2022	-		1.394	0.000	5.795	-
XM20 Engineering Support	MIPR	DEVCOM Armaments Center : Picatinny Arsenal, NJ	-	-		0.913	Apr 2022	0.803	Oct 2022	-		0.803	0.000	1.716	-
XM215 Prototyping Support	MIPR	Naval Surface Warfare Center : Crane, IN	0.500	-		-		-		-		-	0.000	0.500	-
Subtotal			1.780	1.478		2.556		2.197		-		2.197	0.000	8.011	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP7 / Aviation Airborne Expendable Countermeasures

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	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				
XM215 Infrared Development																																
XM215 Engineering and Manufacturing Development	[Redacted]																															
XM215 Design Verification Test	[Redacted]																															
XM215 Flight Test	[Redacted]																															
XM215 Prototype Build	[Redacted]																															
XM215 Flight Test 2									[Redacted]																							
XM215 Developmental and Operational Testing									[Redacted]																							
XM215 Milestone C																	[Redacted]															
XM215 Production																	[Redacted]															
XM20 Radio Frequency Development																																
XM20 Technology Maturation and Risk Reduction	[Redacted]																															
XM20 Data Analysis	[Redacted]																															
XM20 Milestone B	[Redacted]																															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP7 / Aviation Airborne Expendable Countermeasures

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
XM20 Development Contract	[Redacted]				[Redacted]																							
	XM20 EMD																											
XM20 Qualification Build	[Redacted]				[Redacted]																							
	XM20 Qual Build																											
XM20 Critical Design Review					2																							
					XM20 CDR																							
XM20 Developmental Testing					[Redacted]																							
					XM20 DT																							
XM20 Milestone C									3																			
									XM20 MS-C																			
XM20 Test Hardware									[Redacted]																			
									XM20 Test Hardware																			
XM20 Operational Test and Evaluation													[Redacted]															
													XM20 OT&E															
XM20 Production													[Redacted]															
													XM20 Production															

Note
 Project EB9 / Aviation Airborne Expendable Countermeasures within PE 0603639A / Tank and Medium Caliber Ammunitions transitions to Engineering and Manufacturing Development (EMD) under Project EP7 / Aviation Airborne Expendable Countermeasures within PE 0604802A / Weapons and Munitions - Eng Dev.

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) EP7 / <i>Aviation Airborne Expendable Countermeasures</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
XM215 Infrared Development	1	2019	4	2025
XM215 Milestone A	1	2019	1	2019
XM215 Prototyping	1	2019	2	2020
XM215 Down Select	3	2019	3	2019
XM215 Testing Efforts (Stability/Heat/Cold)	3	2019	2	2020
XM215 Flight Testing	1	2020	2	2020
XM215 Milestone B	2	2020	2	2020
XM215 Engineering and Manufacturing Development	2	2020	4	2023
XM215 Design Verification Test	2	2021	3	2021
XM215 Flight Test	2	2021	2	2021
XM215 Prototype Build	3	2021	4	2023
XM215 Flight Test 2	1	2023	1	2023
XM215 Developmental and Operational Testing	2	2023	4	2023
XM215 Milestone C	4	2023	4	2023
XM215 Production	2	2024	2	2029
XM20 Radio Frequency Development	1	2019	4	2025
XM20 Milestone A	1	2019	1	2019
XM20 Prototype Development	1	2019	4	2019
XM20 Demonstrations	2	2019	3	2019
XM20 Technology Maturation and Risk Reduction	1	2020	2	2021
XM20 Flight Testing	2	2020	2	2020
XM20 Modeling and Simulation	3	2020	4	2020

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP7 / Aviation Airborne Expendable Countermeasures
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Events	Start		End	
	Quarter	Year	Quarter	Year
XM20 Data Analysis	1	2021	2	2021
XM20 Milestone B	2	2021	2	2021
XM20 Development Contract	2	2021	4	2022
XM20 Qualification Build	2	2021	3	2022
XM20 Critical Design Review	2	2022	2	2022
XM20 Developmental Testing	2	2022	4	2022
XM20 Milestone C	4	2022	4	2022
XM20 Test Hardware	4	2022	2	2023
XM20 Operational Test and Evaluation	3	2023	3	2023
XM20 Production	3	2023	4	2028

Note

Project EB9 Aviation Airborne Expendable Countermeasures within Program Element (PE) 0603639A Tank and Medium Caliber Ammunitions transitions to EMD under Project EP7 Aviation Airborne Expendable Countermeasures within PE 0604802A Weapons and Munitions - Eng Dev.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EU4 / 40mm HV Improved High Explosive Dual Purpose			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EU4: 40mm HV Improved High Explosive Dual Purpose	-	9.357	2.111	2.073	-	2.073	-	-	-	-	0.000	13.541
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

40 millimeter (mm) High Velocity (HV) High Explosive Dual Purpose - Air burst (HEDP-AB) is a new capability identified as a Warfighter counter-defilade requirement in the 40mm High Velocity Improved High Explosive Dual Purpose Cartridge Capability Development Document (CDD) and will provide the Mk19 Mod 3 Grenade Machine Gun (GMG) an airburst capable cartridge with the ability of achieving required lethal effects against enemy targets in the open and in defilade while maintaining the capability to defeat unarmored and lightly armored vehicles. XM1176 HEDP-AB cartridges are manufactured by de-fuzing legacy M430A1 cartridges and installing a new airburst capable fuze onto the M430A1 warhead. FY 2023 funding supports the Live Fire Testing & Evaluation (LFT&E) that is required due to the program being on Director, Operational Test & Evaluation (DOT&E) Oversight.

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

	FY 2021	FY 2022	FY 2023
<p>Title: Engineering and Manufacturing Development (EMD)</p> <p>Description: Award EMD contracts to support Design Engineering Testing (DET) and Developmental Test & Evaluation (DT&E) of the 40mm dual purpose airburst capability.</p> <p>FY 2022 Plans: FY 2022 funding supports the completion of Developmental Test & Evaluation (DT&E), completion of a Limited User Evaluation (LUE), Milestone-C preparation activities and preparation activities for the Low Rate Initial Production 1 (LRIP 1) contract award.</p> <p>FY 2023 Plans: FY 2023 funding supports the Live Fire Testing & Evaluation (LFT&E) that is required due to the program being on DOT&E Oversight.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Slight increase due to economic assumptions</p>	9.357	2.034	2.073
<p>Title: Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR)</p> <p>FY 2022 Plans: FY 2022 funding to be assessed per SBIR Title 15 USC ?638(f)(1) and STTR Title 15 USC ?638(f)(1)(A).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>	-	0.077	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU4 / 40mm HV Improved High Explosive Dual Purpose

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Allocation of FY 2022 SBIR/STTR was added. FY 2023 SBIR/STTR transfer amount will be determined and assessed in FY 2023.			
Accomplishments/Planned Programs Subtotals	9.357	2.111	2.073

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• E70505: CTG, 40MM, HV HEDP-AB, XM1176	-	13.844	15.853	-	15.853	-	2.972	3.228	3.228	0.000	39.125

Remarks

D. Acquisition Strategy

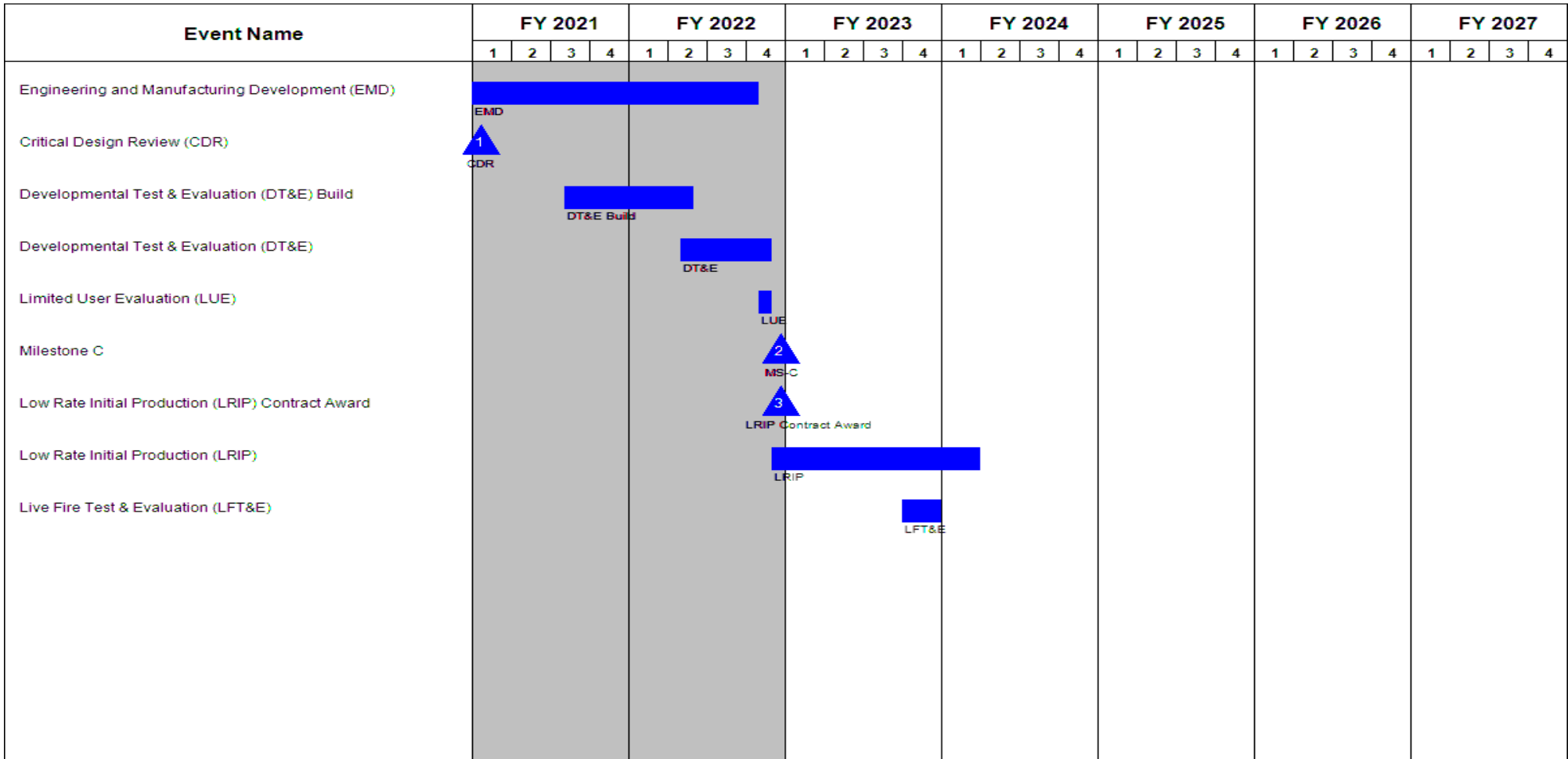
The 40mm HV HEDP-AB cartridge will be developed through a competitive EMD program. Milestone B approval was followed by a competitive award for the EMD phase which included DET 1 and DET 2 and an option for DT&E. One contractor was awarded to develop an air burst capable fuze to be retrofitted onto the currently fielded, High Explosive Dual Purpose cartridges and develop a Programming Unit. Test results will support the documentation for Milestone C. After Milestone C is achieved, a contract option will be awarded for Low Rate Initial Production (LRIP) followed by two options.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EU4 I 40mm HV Improved High Explosive Dual Purpose							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
SBIR/STTR Transfer	TBD	various : various	-	-		0.077	Mar 2022	-		-		-	0.000	0.077	-
Subtotal			-	-		0.077		-		-		-	0.000	0.077	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Project Manager Maneuver Ammunition Systems (PM MAS)	MIPR	Picatinny Arsenal : NJ	0.542	-		-		0.500	Nov 2022	-		0.500	0.000	1.042	-
Engineering and Manufacturing Development (EMD)	C/CPFF	Rheinmatell, Day & Zimmermann Munitions : Rosslyn, Va.	9.830	5.735	Dec 2020	-		-		-		-	0.000	15.565	-
Subtotal			10.372	5.735		-		0.500		-		0.500	0.000	16.607	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
DEVCOM-AC Engineering Support	MIPR	Development Command - Armaments Center (DEVCOM-AC) : Picatinny Arsenal, NJ	5.390	2.024	Oct 2020	1.784	Oct 2021	1.000	Nov 2022	-		1.000	0.000	10.198	-
Subtotal			5.390	2.024		1.784		1.000		-		1.000	0.000	10.198	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU4 / 40mm HV Improved High Explosive Dual Purpose



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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU4 I 40mm HV Improved High Explosive Dual Purpose

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Milestone B Support Documents	2	2017	4	2018
Milestone B	4	2018	4	2018
Engineering and Manufacturing Development (EMD)	4	2018	4	2022
Test Readiness Review for Design Engineering Test 1	4	2019	4	2019
Design Engineering Test (DET) 1	1	2020	2	2020
Test Readiness Review for Design Engineering Test 2	2	2020	2	2020
Design Engineering Test (DET) 2	3	2020	4	2020
Developmental Test & Evaluation (DT&E) Contract Award	4	2020	4	2020
Critical Design Review (CDR)	1	2021	1	2021
Developmental Test & Evaluation (DT&E) Build	3	2021	2	2022
Developmental Test & Evaluation (DT&E)	2	2022	4	2022
Limited User Evaluation (LUE)	4	2022	4	2022
Milestone C	4	2022	4	2022
Low Rate Initial Production (LRIP) Contract Award	4	2022	4	2022
Low Rate Initial Production (LRIP)	4	2022	1	2024
Live Fire Test & Evaluation (LFT&E)	4	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU5 / .50 Caliber All-Purpose Tactical cartridge (APTC)
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EU5: .50 Caliber All-Purpose Tactical cartridge (APTC)	-	3.931	-	-	-	-	-	-	-	-	0.000	3.931
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The APTC project is a critical technology development in response to the .50 caliber Munitions Capabilities Development Documents (CDD). The overall objective of All-Purpose Tactical Cartridge is to deliver Ball and Tracer ammunition that replaces and improves current legacy .50 caliber ammunition. The All-Purpose Tactical Cartridge will be compatible with all Army .50 caliber weapons but specifically optimized to work in the M2 Machine Guns. There is no Fiscal Year (FY) 2023 request.

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

	FY 2021	FY 2022	FY 2023
Title: .50 Cal All-Purpose Tactical Cartridge EMD	3.931	-	-
Description: Engineering and Manufacturing Development (EMD) Activities for the development of the .50 Caliber All-Purpose Tactical Cartridge APTC.			
Accomplishments/Planned Programs Subtotals	3.931	-	-

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

N/A

Remarks

D. Acquisition Strategy

Evaluate competing concepts/prototypes from contractors and Government. In FY 2021, the Government intends to make a decision on continuation of the Engineering and Manufacturing Development (EMD).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EU5 I .50 Caliber All-Purpose Tactical cartridge (APTC)							
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Development Contract # 1	Option/CPFF	To be determined : To be determined	-	1.700	May 2021	-		-		-		-	0.000	1.700	-
Subtotal			-	1.700		-		-		-		-	0.000	1.700	N/A
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
DEVCOM-AC Engineering Support	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	-	0.741	May 2021	-		-		-		-	0.000	0.741	-
ARL Engineering Support	MIPR	Army Research Lab (ARL) : Aberdeen, Maryland	-	0.640	May 2021	-		-		-		-	0.000	0.640	-
Subtotal			-	1.381		-		-		-		-	0.000	1.381	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Pre-Production Qualification Testing (PPQT)	MIPR	US Army Test Center (ATC) : Aberdeen, Maryland	-	0.500	May 2021	-		-		-		-	0.000	0.500	-
Design Verification Testing	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	-	0.350	May 2021	-		-		-		-	0.000	0.350	-
Subtotal			-	0.850		-		-		-		-	0.000	0.850	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army							Date: April 2022				
Appropriation/Budget Activity 2040 / 5			R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EU5 / .50 Caliber All-Purpose Tactical cartridge (APTC)				
	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	-	3.931	-	-	-	-	0.000	3.931	N/A		

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU5 / .50 Caliber All-Purpose Tactical cartridge (APTC)

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
APTC Concept & Prototype Development	■ APTC Concept & Prototype Development																											
APTC Milestone B	▲ 1																											
APTC Engineering & Manufacturing Development (EMD)					■ APTC EMD																							
APTC Design Verification Test (DVT) 2					■ APTC DVT 2																							
APTC Pre-Production Qualification Testing (PPQT)									■ APTC PPQT																			
APTC Engineering & Manufacturing Development (EMD) Continuation Decision Point 2					▲ 2																							
					■ EMD Continue Decision Point																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU5 / .50 Caliber All-Purpose Tactical cartridge (APTC)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
APTC Materiel Development Decision (MDD)	1	2020	1	2020
APTC Concept & Prototype Development	1	2020	1	2021
APTC Design Verification Test (DVT) 1	2	2020	3	2020
APTC Preliminary Design Review (PDR)	4	2020	4	2020
APTC Milestone B	1	2021	1	2021
APTC Engineering & Manufacturing Development (EMD)	2	2021	4	2021
APTC Design Verification Test (DVT) 2	2	2021	3	2021
APTC Pre-Production Qualification Testing (PPQT)	4	2021	4	2021
APTC Engineering & Manufacturing Development (EMD) Continuation Decision Point	4	2021	4	2021

Note

Note:
All-Purpose Tactical Cartridge (APTC)

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EU6 / 155mm HE Rocket Assist Project Extended Range			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EU6: 155mm HE Rocket Assist Project Extended Range	-	51.956	27.655	14.382	-	14.382	29.380	15.911	2.701	-	0.000	141.985
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
XM1113 Extended Range (XM1113ER) nomenclature has been changed to XM1210.

A. Mission Description and Budget Item Justification

The 155 millimeter (mm) High Explosive (HE) Rocket Assisted Projectile, Extended Range Project supports projectile development efforts to achieve ranges of 40km in current 39 caliber artillery weapon systems and longer ranges in future 58 caliber Extended Range Cannon Artillery (ERCA) Self-Propelled Howitzer (SPH) to achieve the Army's requirement of extended range lethality. The Project is executing an evolutionary approach consisting of two parallel efforts to meet the objectives of extended range and precision. The XM1113 will replace the obsolete M549A1 in 39 caliber weapon systems and increase range from 30km to 40km. The XM1210 (formerly known as XM1113ER) will be optimized for 58 caliber guns and allow commanders to provide accurate cannon artillery fires at ranges of 70km and greater with ERCA. These efforts will leverage enhanced lethality cannon munition technologies to compensate for increased rocket motor volume. Fiscal Year (FY) 2023 funding will support the completion of XM1113 qualification activities, engineering efforts to evaluate test data to ensure that the projectile is safe, suitable and operationally effective as well as the gathering of all statutory and regulatory requirements in support of a Milestone C and Full Materiel Release (FMR). FY 2023 funding will also support XM1210 qualification and firing tables testing required for Safety Release for First Unit Issued (FUI) to support the ERCA Operational Assessment, Urgent Materiel Release (UMR) qualification activities and the initiation of FMR development activities.

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

	FY 2021	FY 2022	FY 2023
Title: 155mm High Explosive Rocket Assisted Projectile (RAP) Extended Range	30.956	26.646	14.382
Description: The XM1113 will replace the obsolete M549A1 in 39 caliber weapon systems and increase range from 30km to 40km. The XM1210, previously known as XM1113 Extended Range (XM1113ER), will be optimized for 58 caliber guns and allow commanders to provide accurate cannon artillery fires at ranges of 70km and greater with ERCA.			
FY 2022 Plans: FY 2022 funding supports the completion of activities to ensure that the XM1113 is safe, suitable and operationally effective in current artillery systems, as well as the gathering of all statutory and regulatory requirements in support of a Milestone C and the continuation of ERCA compatibility efforts. FY 2022 funding will also support ongoing XM1210 development and qualification activities to directly support the Army's Long Range Precision Fires Cross Functional Team (LRPF CFT) priorities in support of the National Defense Strategy.			
FY 2023 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU6 / 155mm HE Rocket Assist Project Extended Range		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>FY 2023 funding will support the completion of XM1113 qualification activities, engineering efforts to evaluate test data to ensure that the projectile is safe, suitable and operationally effective as well as the gathering of all statutory and regulatory requirements in support of a Milestone C and Full Materiel Release (FMR). FY 2023 funding will also support XM1210 qualification and firing tables testing required for Safety Release for First Unit Issued (FUI) to support the ERCA Operational Assessment, Urgent Materiel Release (UMR) qualification activities and the initiation of FMR development activities.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decrease in funding in FY 2023 due to the reduction in contract costs associated with the XM1113 hardware required to support qualification and Full Materiel Release (FMR) and Milestone C activities, as well as reduction in development costs and hardware required to support XM1210 as FY 2023 focuses primarily on qualification testing for XM1210.</p>				
<p>Title: FY 2022 SBIR/STTR Transfer</p> <p>Description: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638</p>		-	1.009	-
Accomplishments/Planned Programs Subtotals		30.956	27.655	14.382
		FY 2021	FY 2022	
<p>Congressional Add: Precision Guidance Aft</p> <p>FY 2021 Accomplishments: FY 2021 Congressional Add supported the completion of Precision Guidance Aft development and test efforts to include fuze survivability when fired out of the ERCA weapon system. Knowledge points achieved are being utilized to support long range precision fuze development efforts executed on Program Element 0604802A, Project S36, Precision Guidance Kit, and provide a risk mitigation alternative to support the ERCA System of Systems Operational Assessment.</p>		21.000	-	
Congressional Adds Subtotals		21.000	-	

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU6 / 155mm HE Rocket Assist Project Extended Range
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2021	FY 2022	FY 2023	FY 2023	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Cost To	
			Base	OCO	Total					Complete	Total Cost
• E66501: PROJ, 155mm ARTY HE RAP, XM1113	26.972	52.098	53.588	-	53.588	45.410	46.303	56.495	56.495	0.000	337.361
• E27121: PROJ, 155MM ARTY HE RAP, M1210	-	-	17.489	-	17.489	3.007	18.686	22.764	32.671	0.000	94.617

Remarks
Procurement of Ammunition, Army (PAA) budget line items, Standard Study Numbers E66501 and E27121, have been established to resource the procurement of XM1113 and XM1210 quantities.

D. Acquisition Strategy

The 155mm HE Rocket Assisted Projectile, Extended Range Project is utilizing a competitively awarded DoD Ordnance Technology Consortium (DOTC) Other Transaction Agreement (OTA) initiative with GD-OTS to support the accelerated timeline to develop and qualify the XM1113 for 39 caliber weapon systems as well as 58 caliber Extended Range Cannon Artillery (ERCA) compatibility efforts. A separate competitively awarded DOTC OTA initiative with GD-OTS is being utilized for XM1210 development and qualification activities required to achieve ranges of 70km and greater with ERCA. The Project will complete XM1210 qualification efforts in support of Safety Release for First Unit Issued (FUI) for the ERCA Operational Assessment and Urgent Materiel Release (UMR). A competitive DOTC OTA contract will be utilized to support Engineering Manufacturing and Development (EMD) of the XM1210 Full Materiel Release (FMR) variant. XM1113 will transition to Federal Acquisition Regulation (FAR) based production contracts in support of UMR, Low Rate Initial Production (LRIP) and Full Rate Production (FRP). XM1210 will transition to a FAR based production contract in support of UMR deliveries.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU6 / 155mm HE Rocket Assist Project Extended Range
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Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	Various	Office of the Project Manager (PM) Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ	1.573	0.047	Jul 2021	0.100	Oct 2021	0.100	Oct 2022	-		0.100	0.000	1.820	-
FY 2022 SBIR/STTR Transfer	TBD	Various : Various	-	-		1.009		-		-		-	0.000	1.009	-
Subtotal			1.573	0.047		1.109		0.100		-		0.100	0.000	2.829	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DOTC - XM1113 and XM1210 Engineering and Manufacturing Development (EMD)	MIPR	DoD Ordnance Technology Consortium Other Transaction Agreement (DOTC OTA) : Various	45.749	27.933	Nov 2020	19.078	Nov 2021	6.929	Nov 2022	-		6.929	0.000	99.689	-
Cornerstone - Precision Guidance Aft Development - Congressional Add	MIPR	Cornerstone OTA : Northrup Grumman Defense Systems	7.436	16.825	Jun 2021	-		-		-		-	0.000	24.261	-
Subtotal			53.185	44.758		19.078		6.929		-		6.929	0.000	123.950	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center	5.744	2.781	Mar 2021	2.818	Nov 2021	2.253	Nov 2022	-		2.253	0.000	13.596	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU6 / 155mm HE Rocket Assist Project Extended Range
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Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		(DEVCOM AC) : Picatinny Arsenal, NJ													
Fire Control Software Integration	MIPR	U.S. Army Communications-Electronics Command (CECOM) : Aberdeen, MD	0.200	-		-		-		-		-	0.000	0.200	-
Subtotal			5.944	2.781		2.818		2.253		-		2.253	0.000	13.796	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Water Pit Testing	MIPR	Army Research Lab (ARL) : Adelphi, MD	0.600	-		-		-		-		-	0.000	0.600	-
Qualification Testing	MIPR	Army Test and Evaluation Command (ATEC) Yuma Proving Ground (YPG) : Yuma, AZ	2.665	4.175	Jan 2021	4.650	Mar 2022	5.100	Jan 2023	-		5.100	0.000	16.590	-
Arena Testing	MIPR	Army Test and Evaluation Command (ATEC) Aberdeen Proving Ground (APG) : Aberdeen, MD	1.308	-		-		-		-		-	0.000	1.308	-
Material Testing	MIPR	National Technical Systems (NTS) : Camden, AR	0.206	-		-		-		-		-	0.000	0.206	-
Material Testing	MIPR	Naval Air Warfare Center (NAWC) : China Lake, CA	0.130	-		-		-		-		-	0.000	0.130	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU6 / 155mm HE Rocket Assist Project Extended Range
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Material and Setback Testing	MIPR	Naval Surface Warfare Center (NSWC) : Indian Head, MD	0.139	0.195	Mar 2021	-		-		-		-	0.000	0.334	-
Subtotal			5.048	4.370		4.650		5.100		-		5.100	0.000	19.168	N/A
Project Cost Totals			65.750	51.956		27.655		14.382		-		14.382	0.000	159.743	N/A

Remarks
XM1113 Extended Range (XM1113ER) nomenclature changed to XM1210.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU6 / 155mm HE Rocket Assist Project Extended Range

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
XM1113 High Explosive Rocket Assisted Projectile																												
XM1113 HE RAP Engineering Manufacturing Development (EMD)	[Redacted]																											
39 cal Qualification	[Redacted]																											
39 cal Safety and Robustness Improvement Activities	[Redacted]																											
39 cal Critical Design Review (CDR)	[Redacted]																											
39 cal Urgent Materiel Release (UMR) Deliveries	[Redacted]																											
39 cal Milestone C	[Redacted]																											
39 cal Full Materiel Release (FMR)	[Redacted]																											
XM1210 HE RAP Extended Range																												
XM1210 HE RAP Extended Range EMD	[Redacted]																											
XM1210 Development Testing	[Redacted]																											
XM1210 Preliminary Design Review (PDR)	[Redacted]																											
XM1210 UMR Critical Design Review (CDR)	[Redacted]																											

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU6 / 155mm HE Rocket Assist Project Extended Range

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	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				
XM1210 UMR and Safety Testing																																
XM1210 Milestone B																																
XM1210 FMR Development																																
XM1210 Safety Release (SR) Deliveries																																
Safety Release for ERCA First Unit Issued (FUI)																																
ERCA System of Systems (SoS) Operational Assessment (OA)																																
XM1210 UMR																																
XM1210 FMR CDR																																
XM1210 FMR Qualification Testing																																
XM1210 Milestone C																																
XM1210 Initial Operational Test & Evaluation (IOT&E)																																
XM1210 FMR																																
Precision Guidance Aft (PG-Aft) - Congressional Add																																

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022		
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev		Project (Number/Name) EU6 / 155mm HE Rocket Assist Project Extended Range	

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
PG-Aft Development & Testing	[REDACTED]				[REDACTED]																							

Note
 XM1113 will achieve lethality against targets at 40km range. XM1210 (formerly XM1113ER) will achieve 70+km out of ERCA.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) EU6 / <i>155mm HE Rocket Assist Project Extended Range</i>
<p>FY 2021 Congressional Add supported the completion of Precision Guidance Aft development and test efforts to include fuze survivability when fired out of the ERCA weapon system. Knowledge points achieved are being utilized to support long range precision fuze development efforts executed on Program Element 0604802A, Project S36, Precision Guidance Kit, and provide a risk mitigation alternative to support the ERCA System of Systems Operational Assessment.</p>		

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU6 / 155mm HE Rocket Assist Project Extended Range

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
XM1113 High Explosive Rocket Assisted Projectile	1	2019	4	2023
XM1113 HE RAP Engineering Manufacturing Development (EMD)	4	2019	1	2023
39 cal Qualification	4	2019	1	2023
39 cal Safety and Robustness Improvement Activities	1	2021	3	2022
39 cal Critical Design Review (CDR)	2	2022	2	2022
39 cal Urgent Materiel Release (UMR) Deliveries	3	2023	1	2024
39 cal Milestone C	1	2024	1	2024
39 cal Full Materiel Release (FMR)	2	2025	2	2025
XM1210 HE RAP Extended Range	3	2021	4	2023
XM1210 HE RAP Extended Range EMD	2	2020	1	2027
XM1210 Development Testing	1	2021	2	2022
XM1210 Preliminary Design Review (PDR)	2	2021	2	2021
XM1210 UMR Critical Design Review (CDR)	2	2022	2	2022
XM1210 UMR and Safety Testing	4	2022	4	2023
XM1210 Milestone B	1	2023	1	2023
XM1210 FMR Development	1	2023	4	2024
XM1210 Safety Release (SR) Deliveries	4	2023	3	2024
Safety Release for ERCA First Unit Issued (FUI)	4	2023	4	2023
ERCA System of Systems (SoS) Operational Assessment (OA)	1	2024	4	2024
XM1210 UMR	4	2024	4	2024
XM1210 FMR CDR	1	2025	1	2025
XM1210 FMR Qualification Testing	1	2025	4	2026

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU6 / 155mm HE Rocket Assist Project Extended Range
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Events	Start		End	
	Quarter	Year	Quarter	Year
XM1210 Milestone C	4	2025	4	2025
XM1210 Initial Operational Test & Evaluation (IOT&E)	4	2025	4	2025
XM1210 FMR	1	2027	1	2027
Precision Guidance Aft (PG-Aft) - Congressional Add	1	2020	1	2022
PG-Aft Development & Testing	1	2020	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU7 / Enhanced Lethality Cannon Munitions
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EU7: Enhanced Lethality Cannon Munitions	-	15.000	-	-	-	-	-	-	-	-	0.000	15.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enhanced Lethality Cannon Munitions (ELCM) Project will evaluate, develop, and qualify new lethality technologies for 155 millimeter (mm) cannon artillery munitions and evaluate their effectiveness in mitigating evolving and derived capability gaps, and support transition to production. The ELCM Project supports testing and assessment of the Israeli Military Industries (IMI) Systems M999 advanced anti-personnel munition in support the Army Directed Requirement for a Rapid Bridging Solution for the replacement of the 155mm Dual Purpose Improved Conventional Munition (DPICM). This Project also accelerates the qualification of the 155mm XM1128 High Explosive Projectile, which will replace the M795 Critical Munition once qualified. Engineering efforts are ongoing and will support the evaluation of the XM1128 test data to determine that the Program is safe, suitable and operationally effective, as well as the gathering of all statutory and regulatory requirements in support of a Milestone C. In FY 2023, this Project does not have a Research Development Technology & Evaluation (RDT&E) request.

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

	FY 2021	FY 2022
Congressional Add: 155mm XM1128 High Explosive Projectile	15.000	-
FY 2021 Accomplishments: FY 2021 Congressional Add funding is supporting the completion of XM1128 Engineering Manufacturing and Development activities and Extended Range Cannon Artillery (ERCA) weapon system and propulsion compatibility activities.		
Congressional Adds Subtotals	15.000	-

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

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• E67802: PROJ, 155mm ARTY HE-BB, XM1128	-	16.961	28.825	-	28.825	65.512	68.139	83.457	83.457	0.000	346.351

Remarks

In FY 2022, XM1128 is transitioning to production. A Procurement of Ammunition, Army (PAA) funding line, Standard Study Number (SSN) E67802, PROJ, 155mm ARTY HE-BB, XM1128, has been established.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU7 / Enhanced Lethality Cannon Munitions

D. Acquisition Strategy

The XM1128 High Explosive munition has been accelerated for qualification, per the Army Directed Requirement for a Rapid Bridging Solution for the 155mm DPICM as of 22 December 2016, as an inherent part of the Rapid Bridging solution for 155mm DPICM. Prototyping was awarded in 1st Quarter (1Q) FY 2018 through Department of Defense (DoD) Ordnance Technology Consortium (DOTC) Other Transaction Agreement (OTA) initiatives to multiple vendors (subcontractors to United States (U.S.) Government system integrator) through Engineering & Manufacturing Development (EMD). The U.S. Government will lead EMD efforts to complete development by end 4Q FY 2020. Milestone C approval is in 2Q FY 2021. Following Milestone C, the XM1128 will be competed via Federal Acquisition Regulation (FAR) based contracts for Load, Assemble, and Pack (LAP) and metal parts in support of Low Rate Initial Production (LRIP) and follow-on production activities. Full Material Release (FMR) is planned for 1Q FY 2022.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU7 / Enhanced Lethality Cannon Munitions
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Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Enhanced Lethality Cannon Munitions (ELCM) Program Management	Various	Office of the Project Manager (PM) Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ	0.636	-		-		-		-		-	0.000	0.636	-
Subtotal			0.636	-		-		-		-		-	0.000	0.636	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
XM1128 Qualification Test (PQT) Hardware	MIPR	DoD Ordnance Technology Consortium (DOTC) : Various	16.313	3.250	Oct 2021	-		-		-		-	0.140	19.703	-
XM1128 Qualification Test (PQT) Hardware	Reqn	Cornerstone Other Transaction Agreement (OTA) : Various	3.076	4.573	Nov 2021	-		-		-		-	0.000	7.649	-
XM1113 Prototype Hardware	MIPR	DoD Ordnance Technology Consortium (DOTC) : Various	4.494	-		-		-		-		-	0.000	4.494	-
Subtotal			23.883	7.823		-		-		-		-	0.140	31.846	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
XM1128 Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center	10.238	3.546	Sep 2021	-		-		-		-	1.377	15.161	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU7 / Enhanced Lethality Cannon Munitions
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Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		(CCDC AC) : Picatinny Arsenal, NJ													
XM1128 Firing Table Software Updates	MIPR	Combat Capabilities Development Command Armaments Center (CCDC AC) : Picatinny Arsenal, NJ	2.123	0.821	Sep 2021	-		-		-		-	0.000	2.944	-
M999 Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center (CCDC AC) : Picatinny Arsenal, NJ	0.750	-		-		-		-		-	0.000	0.750	-
XM1113 Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center (CCDC AC) : Picatinny Arsenal, NJ	0.606	-		-		-		-		-	0.000	0.606	-
Subtotal			13.717	4.367		-		-		-		-	1.377	19.461	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
XM1128 Testing	MIPR	Army Test and Evaluation Command (ATEC) Yuma Proving Ground (YPG) : Yuma, AZ	4.589	2.810	Jan 2022	-		-		-		-	0.000	7.399	-
XM1128 Testing	MIPR	Naval Surface Warfare Center	1.575	-		-		-		-		-	0.000	1.575	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU7 / Enhanced Lethality Cannon Munitions	

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027											
	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								
155mm XM1128 High Explosive Projectile																																				
Performance Qualification Testing (PQT)																																				
ERCA Compatibility Testing																																				
Milestone C									1 MS-C																											
Full Materiel Release (FMR)																	2 FMR																			

Note
FY 2021 Congressional Add funding is supporting the completion of XM1128 Engineering Manufacturing and Development activities and Extended Range Cannon Artillery (ERCA) weapon system and propulsion compatibility activities.

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU7 / Enhanced Lethality Cannon Munitions

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
155mm XM1128 High Explosive Projectile	3	2017	1	2023
Performance Qualification Testing (PQT)	2	2019	3	2022
ERCA Compatibility Testing	3	2022	4	2023
Milestone C	3	2022	3	2022
Full Materiel Release (FMR)	3	2024	3	2024
M999	4	2018	4	2019
M999 Testing	4	2018	4	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EU8 / Improved Multi-Option Fuze			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EU8: Improved Multi-Option Fuze	-	7.700	4.562	-	-	-	-	-	-	-	0.000	12.262
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Improved Multi-Option Fuze Project is a technology refresh and modernization effort that provides an incremental capability with technology advancements and performance improvements on the current non-precision artillery and mortar ammunition proximity multi-option fuze that will increase robustness to electronic countermeasures (ECM), eliminates the susceptibility of reverse engineering (RE), incorporates power source advancements, improves delay mode reliability, and integrates safe & arm improvements. This Project will develop and qualify safe, affordable, reliable, Proximity Height of Burst fuzing solutions with robust Defense Exportability Features (DEF) for non-precision conventional cannon artillery and mortar munitions that are resistant to adversary exploitation via ECM and RE threats. This Project does not have a Fiscal Year (FY) 2023 budget request.

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

	FY 2021	FY 2022	FY 2023
Title: Improved Multi-Option Fuze Development	7.700	4.395	-
Description: Develop and qualify improved multi-option fuze technologies.			
FY 2022 Plans: FY 2022 funding supports the completion of Multi-Option Fuze Artillery (MOFA) II and Improved Multi-Option Fuze Mortar (iMOFM) hardware fabrication required for design verification and qualification testing. Funding will also support engineering efforts to evaluate test data to ensure that MOFA II and iMOFM are safe, suitable and operationally effective, as well as the gathering of all statutory and regulatory requirements in support of a Milestone C.			
FY 2022 to FY 2023 Increase/Decrease Statement: Decrease is based on a projected decline in requirements in FY 2023.			
Title: FY 2022 SBIR/STTR Transfer	-	0.167	-
Description: Funding transferred in accordance with Title 15 USC ?638			
FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638			
FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	7.700	4.562	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU8 / Improved Multi-Option Fuze

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

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• E99909: <i>Multi-Option Fuze, Artillery M782</i>	-	13.653	0.000	-	0.000	-	-	-	-	0.000	13.653

Remarks

FY 2022 Procurement of Ammunition, Army (PAA) funding will be executed on Standard Study Number (SSN) E99909, Multi-Option Fuze, Artillery (MOFA) M782 for the procurement of legacy MOFA fuzes.

D. Acquisition Strategy

The Improved Multi-Option Fuze Project currently utilizes the DoD Ordnance Technology Consortium Other Transaction Agreement (DOTC OTA) with incrementally funded Engineering and Manufacturing Development (EMD) contracts for improved and modernized Multi-Option Fuze Artillery (MOFA) II detailed designs and the fabrication of hardware through FY 2022. The Improved Multi-Option Fuze Project will enhance the existing multi-option fuzes for cannon artillery and mortar munitions programs of record. Detailed government-owned Technical Data Packages (TDPs) will enable "build to print" designs to facilitate competitive Federal Acquisition Regulation (FAR) based contracting for procurement. Qualified MOFA II will be a Technology Readiness Level 8 (TRL-8) TC design with a mature technical design packages for production. Parallel Improved Multi-Option Fuze Mortar (iMOFM) effort will be a qualified TRL-8 design for incorporation into mortar cartridge production.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU8 / Improved Multi-Option Fuze
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Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	Various	Office of the Project Manager (PM) Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ	1.033	-		-		-		-		-	0.000	1.033	-
FY 2022 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.167		-		-		-	0.000	0.167	-
Subtotal			1.033	-		0.167		-		-		-	0.000	1.200	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
MOFA II Development & PQT Support	MIPR	DoD Ordnance Technology Consortium (DOTC) : Various	11.470	5.232	Jan 2021	0.350	Nov 2021	-		-		-	0.000	17.052	-
iMOFM Fuze Test Hardware & Qualification	MIPR	DoD Ordnance Technology Consortium (DOTC) : Various	2.332	-		0.478	Jan 2022	-		-		-	0.000	2.810	-
Subtotal			13.802	5.232		0.828		-		-		-	0.000	19.862	N/A

Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	3.936	1.517	Nov 2020	1.217	Nov 2021	-		-		-	0.000	6.670	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EU8 / Improved Multi-Option Fuze							
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Fuze Engineering Support	C/LH	SAVIT Corporation : Rockaway, NJ	-	-		0.150	May 2022	-		-		-	0.000	0.150	-
Subtotal			3.936	1.517		1.367		-		-		-	0.000	6.820	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Improved Multi-Option Fuze Test and Evaluations	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	-	-		0.250	Dec 2021	-		-		-	0.000	0.250	-
Improved Multi-Option Fuze Test and Evaluations	MIPR	Army Test and Evaluation Command (ATEC) Yuma Proving Ground (YPG) : Yuma, AZ	0.464	0.631	Mar 2021	1.250	Jan 2022	-		-		-	0.000	2.345	-
Improved Multi-Option Fuze Test and Evaluations	MIPR	U.S. Army Research Lab (ARL) : Adelphi, MD	0.400	-		-		-		-		-	0.000	0.400	-
Improved Multi-Option Fuze Test and Evaluations	MIPR	Army Test and Evaluation Command (ATEC) Aberdeen Proving Ground (APG) : Aberdeen, MD	0.040	-		0.120	Nov 2021	-		-		-	0.000	0.160	-
Improved Multi-Option Fuze Test and Evaluations	MIPR	White Sands Missile Range (WSMR) : White Sands, NM	0.315	0.320	Jan 2022	0.330	Dec 2021	-		-		-	0.000	0.965	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU8 / Improved Multi-Option Fuze
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Improved Multi-Option Fuze Cyber Security Testing	MIPR	TBD : TBD	-	-		0.250	Mar 2022	-		-		-	0.000	0.250	-
Subtotal			1.219	0.951		2.200		-		-		-	0.000	4.370	N/A

Remarks
Cyber Security testing for MOFA II is required during Fiscal Year (FY) 2021 and FY 2022. The test location will be determined based on informed requirements by March 2021.

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	19.990	7.700	4.562	-	-	-	0.000	32.252	N/A

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU8 / Improved Multi-Option Fuze

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Fabricate Prototypes	3	2018	3	2019
Conduct Evaluations and Design Reviews	2	2019	4	2019
MOFA II	3	2019	4	2022
Fabricate MOFA II System Level Qualification Hardware	2	2020	4	2021
MOFA II Safety, Reliability, Environmental, Qualification Testing	1	2021	3	2022
MOFA II Milestone C	3	2022	3	2022
iMOFM	2	2020	4	2022
Fabricate iMOFM System Level Qualification Hardware	3	2020	2	2022
iMOFM Qualification Testing	4	2021	3	2022
iMOFM Engineering Change Proposal (ECP)	4	2022	4	2022

Note

Multi-Option Fuze Artillery (MOFA)
improved Multi-Option Fuze Mortar (iMOFM)

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EW1 / 40mm Low Velocity Ammunition			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EW1: 40mm Low Velocity Ammunition	-	20.259	3.640	2.045	-	2.045	2.157	2.951	-	-	0.000	31.052
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The 40 millimeter (mm) Low Velocity High Explosive Air Burst (HEAB) is a new capability identified as a Warfighter counter-defilade requirement in the Capability Development Document (CDD), 40mm Low Velocity (LV) Family of Ammunition Annex. The HEAB tactical cartridge allows the Warfighter to engage targets at increased effective ranges using the 40mm M320 Grenade Launcher. The HEAB cartridge provides the grenadier with a higher probability of achieving a first shot kill against enemy personnel, coupled with the ability to defeat personnel targets in defilade positions. When deployed against point and area targets, the cartridge inflicts incapacitating effects against personnel beyond those offered by the current M433 High Explosive Dual Purpose (HEDP) cartridge. The cartridge provides lethal effects against targets with improved accuracy and greater standoff ranges resulting in increased soldier survivability. FY 2023 activities will include the continuation of Developmental Test & Evaluation (DT&E), support for Milestone C, execution of an additional Soldier Touch Point (STP 4) and the award of a follow on Low Rate Initial Production (LRIP) contract.

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

	FY 2021	FY 2022	FY 2023
<p>Title: 40mm LV HEAB, XM1166</p> <p>Description: Engineering Manufacturing Development (EMD) of the 40mm LV HEAB munition.</p> <p>FY 2022 Plans: FY 2022 activities will include conducting Developmental Test & Evaluation (DT&E) testing and Solider Touch Point 3 (STP 3).</p> <p>FY 2023 Plans: FY 2023 activities will include the continuation of Developmental Test & Evaluation (DT&E), support for Milestone C, execution of an additional Soldier Touch Point (STP 4) and the award of a follow on Low Rate Initial Production (LRIP) contract.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Decrease in funding from FY 2022 to FY 2023 is attributed to subsystem design and testing in preparation for DT&E in FY 2022 - 2023. Program enters Low Rate Initial Production in FY 2024.</p>	20.259	3.508	2.045
<p>Title: Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR)</p> <p>FY 2022 Plans: FY 2022 funding to be assessed per SBIR Title 15 USC ?638(f)(1) and STTR Title 15 USC ?638(f)(1)(A).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>	-	0.132	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EW1 / 40mm Low Velocity Ammunition

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Allocation of FY 2022 SBIR/STTR was added. FY 2023 SBIR/STTR transfer amount will be determined and assessed in FY 2023.			
Accomplishments/Planned Programs Subtotals	20.259	3.640	2.045

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

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• E71005: CTG, 40MM, LV HEAB, XM1166	-	10.500	13.888	-	13.888	-	-	-	-	0.000	24.388

Remarks

D. Acquisition Strategy

The HEAB cartridge will be developed through a competitive Engineering and Manufacturing Development (EMD) Program. Potential designs were evaluated as part of the pre-EMD activities using a Cooperative Research and Development Agreement (CRADA) with contractors. For EMD, the Government awarded two contracts utilizing an Other Transaction Agreement (OTA) through Department of Defense (DoD) Ordnance Technology Consortium (DOTC). The EMD phase will consist of a series of Design Engineering Tests (DET) to assess the Contractors' design progress and ability of achieving the program objectives. Any shortcomings and deficiencies will be addressed prior to Developmental Test & Evaluation (DT&E). After DT&E and a successful Milestone C, the Government will award a single contract for Low Rate Initial Production (LRIP) and four production year options utilizing a follow-on Federal Acquisition Regulation (FAR) based contract.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EW1 / 40mm Low Velocity Ammunition								
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
SBIR/STTR Transfer	TBD	various : various	-	-		0.132	Mar 2022	-		-		-	0.000	0.132	-	
Subtotal			-	-		0.132		-		-		-	0.000	0.132	N/A	
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
LV HEAB XM1166 Contractor 1	C/CPFF	Day & Zimmerman, Inc (DZI) : Middletown, IA	14.479	7.700	Jan 2021	1.000	Jan 2022	-		-		-	Continuing	Continuing	Continuing	
LV HEAB XM1166 Contractor 2	C/CPFF	Nammo Perry, Inc. : Perry, FL	11.240	7.700	Jan 2021	1.000	Jan 2022	-		-		-	Continuing	Continuing	Continuing	
Subtotal			25.719	15.400		2.000		-		-		-	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	
LV HEAB XM1166 - Engineering Support	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, NJ	3.804	3.759	Jan 2021	0.600	Nov 2021	-		-		-	Continuing	Continuing	Continuing	
LV HEAB XM1166 - Lethality Analysis	MIPR	Data & Analysis Center (DAC) : Aberdeen Proving Ground, Md	-	-		0.100	Nov 2021	-		-		-	0.000	0.100	-	
Subtotal			3.804	3.759		0.700		-		-		-	Continuing	Continuing	N/A	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EW1 / 40mm Low Velocity Ammunition
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LV HEAB XM1166 Design Engineering Test (DET) 3	MIPR	Aberdeen Test Center (ATC) : Aberdeen, MD	-	1.100	Jan 2021	-		-		-		-	0.000	1.100	-
LV HEAB XM1166 Developmental Test and Evaluation (DT&E)	MIPR	Aberdeen Test Center (ATC) : Aberdeen, MD	-	-		0.707	Dec 2021	1.873	Jan 2023	-		1.873	0.000	2.580	-
Soldier Touch Point 3 & 4 (STP 3 & 4)	MIPR	Aberdeen Test Center (ATC) : Aberdeen, MD	-	-		0.101	Apr 2022	0.172	Apr 2022	-		0.172	0.000	0.273	-
Subtotal			-	1.100		0.808		2.045		-		2.045	0.000	3.953	N/A
Project Cost Totals			29.523	20.259		3.640		2.045		-		2.045	Continuing	Continuing	N/A

Remarks
Notes:
Low Velocity (LV)
High Explosive Air Burst (HEAB)

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EW1 / 40mm Low Velocity Ammunition

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	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				
40mm HEAB XM1166 Engineering Manufacturing Development	[Blue bar]																															
40mm HEAB XM1166 Design Engineering Test DET 2	[Blue bar]																															
40mm Soldier Touch Point 2 (STP2)	[Blue square]																															
40mm HEAB XM1166 Critical Design Review																																
40mm HEAB XM1166 Design Engineering Test DET 3	[Blue bar]																															
40mm HEAB XM1166 Subsystem Testing																																
40mm Soldier Touch Point 3 (STP3)																																
40mm HEAB XM1166 DT&E																																
40mm Soldier Touch Point 4 (STP4)																																
40mm HEAB XM1166 Milestone C																																
40mm HEAB XM1166 Low Rate Initial Production																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) EW1 / <i>40mm Low Velocity Ammunition</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
40mm HEAB XM1166 Cooperative Research & Development Agreement (CRADA) Testing	3	2017	1	2018
40mm HEAB XM1166 Milestone B	4	2018	4	2018
40mm HEAB XM1166 Engineering Manufacturing Development	4	2018	4	2022
40mm HEAB XM1166 Preliminary Design Review	2	2019	2	2019
40mm HEAB XM1166 Design Engineering Test DET 1	1	2020	2	2020
40mm Soldier Touch Point 1 (STP1)	1	2020	2	2020
40mm HEAB XM1166 Design Engineering Test DET 2	4	2020	2	2021
40mm Soldier Touch Point 2 (STP2)	2	2021	2	2021
40mm HEAB XM1166 Critical Design Review	3	2022	3	2022
40mm HEAB XM1166 Design Engineering Test DET 3	3	2021	4	2021
40mm HEAB XM1166 Subsystem Testing	1	2022	3	2022
40mm Soldier Touch Point 3 (STP3)	4	2022	4	2022
40mm HEAB XM1166 DT&E	2	2023	4	2023
40mm Soldier Touch Point 4 (STP4)	3	2023	3	2023
40mm HEAB XM1166 Milestone C	4	2023	4	2023
40mm HEAB XM1166 Low Rate Initial Production	1	2024	4	2024

Note

millimeter (mm)
 Low Velocity (LV)
 High Explosive Air Burst (HEAB)

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FA6 / 30mm Lethality
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
FA6: 30mm Lethality	-	22.359	8.939	8.653	-	8.653	3.078	-	-	-	0.000	43.029
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The 30 millimeter (mm) Lethality project funds the development of a suite of 30x173mm caliber cartridges, which includes a XM1182 High Explosive Airburst with Trace (HEAB-T) cartridge for increased anti-personnel effects, XM1170 Armor Piercing Fin Stabilized Discarding Sabot with Trace (APFSDS-T) cartridge for anti-materiel, and ballistically matched training cartridges; XM1173 Target Practice with Trace (TP-T) cartridge and XM1172 Target Practice Discarding Sabot with Trace (TPDS-T) cartridge. The objective is to enhance the operational effectiveness and lethality of the Stryker Infantry Carrier Vehicle (ICV), Next Generation Combat Vehicle (NGCV), and any Army Fighting Vehicles that are equipped with a 30x173mm weapon system. The tactical APFSDS-T cartridge will provide an organic direct fire capability to support infantry at a greater range and will improve lethality when engaging light-to-medium armored vehicles. The HEAB-T cartridge will provide the Warfighter with increased lethality against troops in the open, counter defilade, Anti-Tank Guided Missile (ATGM) teams, and troops behind urban structures. The training cartridges will be ballistically matched to the tactical cartridges, allowing the Warfighter to train in a cost effective manner. This project is a follow-on of the earlier efforts in support of the United States Army Europe (USAREUR) Operational Needs Statement (ONS) #15-20590 Stryker Increased Lethality for the 2nd Cavalry Regiment (2CR). Fiscal Year (FY) 2023 funding will support the continuation of Engineering, Manufacturing and Development (EMD) for all cartridges to include completion of Developmental Test & Evaluation (DT&E), preparation and execution of Milestone C decision, platform integration testing, and Live Fire Test & Evaluation (LFT&E) hardware fabrication and test assets.

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

	FY 2021	FY 2022	FY 2023
<p>Title: 30X173mm Armor-Piercing Fin-Stabilized Discarding with Sabot Trace (APFSDS-T) and Target Practice Discarding Sabot with Trace (TPDS-T)</p> <p>Description: Qualify 30x173mm armor piercing tactical and training cartridges for use on Stryker ICV, NGCV or other Army Future Fighting Vehicles.</p> <p>FY 2022 Plans: FY 2022 primary activities will include Developmental Test & Evaluation (DT&E) hardware fabrication and testing and preparation for Milestone C decision.</p> <p>FY 2023 Plans: FY 2023 primary activities will include Live Fire Test & Evaluation (LFT&E) hardware fabrication/test assets and conducting Milestone C decision.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>	12.654	3.149	3.653

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FA6 / 30mm Lethality
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 funding increases due to additional engineering support required for Milestone C preparation and execution. Remaining activities will include hardware build for LFT&E and conducting Milestone C review.			
<p>Title: 30x173mm HEAB-T and TP-T</p> <p>Description: Develop and qualify a 30x173mm airburst cartridge and trainer for use on Stryker Infantry Combat Vehicles (ICV), Next Generation Combat Vehicles (NGCV), or other Army Future Fighting Vehicles.</p> <p>FY 2022 Plans: FY 2022 funding to be assessed per SBIR Title 15 USC ?638(f)(1) and STTR Title 15 USC ?638(f)(1)(A). FY 2022 primary activities will include DT&E testing and preparation for Milestone C decision.</p> <p>FY 2023 Plans: FY 2023 primary activities will include integration testing, conducting Milestone C decision, and Live Fire Test & Evaluation (LFT&E) hardware fabrication/test assets.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Allocation of FY 2022 SBIR/STTR was added. FY 2023 SBIR/STTR transfer amount will be determined and assessed in FY 2023. FY 2023 funding decreases due to DT&E cartridge build and test completion in FY 2022. Remaining activities will only include platform integration testing, conducting Milestone C review, and hardware build for LFT&E.</p>	9.705	5.464	5.000
<p>Title: Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR)</p> <p>FY 2022 Plans: FY 2022 funding to be assessed per SBIR Title 15 USC ?638(f)(1) and STTR Title 15 USC ?638(f)(1)(A).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Allocation of FY 2022 SBIR/STTR was added. FY 2023 SBIR/STTR transfer amount will be determined and assessed in FY 2023.</p>	-	0.326	-
Accomplishments/Planned Programs Subtotals	22.359	8.939	8.653

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• E07610: CTG, 30MM, Progrmabl Air Burst Mun, Mk310, Linked	-	-	8.910	-	8.910	23.340	20.629	21.027	20.735	0.000	94.641
• E07306: CTG, 30mm TP-T, MK239, Single	-	0.826	30.439	-	30.439	37.790	38.465	39.175	39.497	0.000	186.192

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FA6 / 30mm Lethality
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2021	FY 2022	FY 2023	FY 2023	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	Cost To	
			Base	OCO	Total					Complete	Total Cost
• E07406: CTG, 30mm Hi Expl Incendry-T(HEI-T), Mk238 Series	-	-	8.603	-	8.603	10.853	7.320	7.358	7.399	0.000	41.533
• E09191: CTG, 30mm TPDS-T, MK317 (SABOT Trng), Single	-	6.000	32.078	-	32.078	61.659	62.941	64.417	65.781	0.000	292.876
• E09292: CTG, 30mm APFSDS-T, MK258, Single	2.564	7.000	37.133	-	37.133	46.197	41.645	36.497	34.103	0.000	205.139

Remarks
Items listed in Other Program Funding will be updated in FY 2023 with the corresponding XM rounds as reflected in the Mission Description.

D. Acquisition Strategy

30X173mm APFSDS-T and TPDS-T: Proposals were requested from Industry to develop a 30x173mm APFSDS-T anti-materiel tactical cartridge (XM1170) and a 30x173mm TPDS-T ballistically matched training cartridge (XM1172) that will meet Army Performance Specifications and Stryker Lethality Annex Requirements. The Government awarded two contracts utilizing an Other Transaction Agreement (OTA) through Department of Defense (DoD) Ordnance Technology Consortium (DOTC) to support development, Design Engineering Tests (DET) and down-select to one contract for Developmental Test & Evaluation (DT&E) in support of Milestone C. The Government will award Federal Acquisition Regulation (FAR)-based contracts for production of each cartridge.

30x173mm HEAB-T and TP-T: In support of the approved 30mm Multi-Function Munition Capability Development Document (CDD), the 30x173mm HEAB-T cartridge (XM1182) and the ballistically matched TP-T cartridge (XM1173) will be developed to meet the requirements. The Government awarded two contracts utilizing an Other Transaction Agreement (OTA) through Department of Defense (DoD) Ordnance Technology Consortium (DOTC) to support development, Design Engineering Tests (DET) and down-select to one contract for Developmental Test & Evaluation (DT&E) in support of Milestone C. The Government will down-select and award a single FAR-based contract for production of the XM1182 HEAB-T cartridge, and up to two FAR based contracts for the XM1182 HEAB-T and XM1173 TP-T cartridge.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FA6 / 30mm Lethality
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Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
SBIR/STTR Transfer	TBD	Various : Various	-	-		0.326		-		-		-	0.000	0.326	-
Subtotal			-	-		0.326		-		-		-	0.000	0.326	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
High Explosive Airburst with Trace (HEAB-T) EMD Contract 1	C/CPFF	General Dynamics - Ordnance and Tactical Systems (GD-OTS) : Marion, IL	8.868	-		0.560	Jan 2022	-		-		-	0.000	9.428	-
High Explosive Airburst with Trace (HEAB-T) EMD Contract 2	C/CPFF	Northrop Grumman Information Systems (NGIS) : Plymouth, MN	10.997	6.066	Apr 2021	0.560	Jan 2022	-		-		-	0.000	17.623	-
High Explosive Airburst with Trace (HEAB-T) LFTE Assets	C/FFP	TBD : TBD	-	-		-		1.000	Jan 2023	-		1.000	0.000	1.000	-
Armor Piercing Fin Stabilized Discarding Sabot with Trace (APFSDS-T) EMD Contract 1	C/CPFF	General Dynamics - Ordnance and Tactical Systems (GD-OTS) : Marion, IL	3.275	1.749	Aug 2021	0.280	Jan 2022	-		-		-	0.000	5.304	-
Armor Piercing Fin Stabilized Discarding Sabot with Trace (APFSDS-T) EMD Contract 2	C/CPFF	Northrop Grumman Information Systems (NGIS) : Plymouth, MN	7.306	9.117	Feb 2021	0.534	Jan 2022	-		-		-	0.000	16.957	-
Armor Piercing Fin Stabilized Discarding Sabot with Trace (APFSDS-T) LFTE	C/FFP	TBD : TBD	-	-		-		0.800	Jan 2023	-		0.800	0.000	0.800	-
Subtotal			30.446	16.932		1.934		1.800		-		1.800	0.000	51.112	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				FA6 / 30mm Lethality							
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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	Development Command - Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	7.200	1.761	Jan 2021	2.000	Nov 2021	3.500	Nov 2022	-		3.500	Continuing	Continuing	Continuing
APFSDS-T / TPSD-T DAC Support	MIPR	Development Command - Data Analysis Center (DEVCOM DAC) : Aberdeen Proving Ground, MD	-	0.272	Apr 2021	-		-		-		-	0.000	0.272	-
Subtotal			7.200	2.033		2.000		3.500		-		3.500	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
APFSDS-T Design Engineering Tests (DET)	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	-	0.665	Mar 2021	-		-		-		-	0.000	0.665	-
APFSDS-T / TPSD-T Surrogate Test	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	-	0.091	Mar 2021	-		-		-		-	0.000	0.091	-
APFSDS-T / TPSD-T Developmental Test & Evaluation (DT&E)	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	-	-		1.335	Mar 2022	-		-		-	0.000	1.335	-
APFSDS-T Live Fire Test & Evaluation (LFTE) Test	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	-	-		-		1.353	Jul 2023	-		1.353	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FA6 / 30mm Lethality
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Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
HEAB-T / TP-T Urban Wall Targets	MIPR	Redstone Test Center (RTC) : Redstone Arsenal, AL	-	0.594	Nov 2021	-		-		-		-	0.000	0.594	-
HEAB-T / TP-T E3 Testing	MIPR	White Sands Missile Range (WSMR) : White Sands Missile Range, NM	-	0.349	Nov 2021	-		-		-		-	0.000	0.349	-
HEAB-T Design Engineering Tests (DET)	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	-	1.695	Feb 2021	-		-		-		-	0.000	1.695	-
HEAB-T / TP-T Developmental Test & Evaluation (DT&E)	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	-	-		3.344	Jan 2022	-		-		-	0.000	3.344	-
HEAB-T Platform Integration and Live Fire Test & Evaluation (LFTE) Test	MIPR	Aberdeen Test Center (ATC) : Aberdeen Proving Ground, MD	-	-		-		2.000	Jul 2023	-		2.000	Continuing	Continuing	Continuing
Subtotal			-	3.394		4.679		3.353		-		3.353	Continuing	Continuing	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	37.646	22.359	8.939	8.653	-	8.653	Continuing	Continuing	N/A

Remarks
 Design Engineering Tests (DET)
 Engineering and Manufacturing Development (EMD)


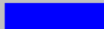




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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) FA6 / <i>30mm Lethality</i>

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
30mm APFSDS-T / TPDS-T EMD	[Redacted]																											
30mm APFSDS-T / TPDS-T DET Build	[Redacted]																											
30mm APFSDS-T / TPDS-T Design Engineering Test (DET)	[Redacted]																											
30mm APFSDS-T / TPDS-T Critical Design Review (CDR)	[Redacted]																2 ▲ APFSDS-T CDR											
30mm APFSDS-T / TPDS-T DT&E Hardware Build	[Redacted]																											
30mm APFSDS-T / TPDS-T Developmental Test & Evaluation (DT&E)	[Redacted]																											
30mm APFSDS-T / TPDS-T Milestone C	[Redacted]																4 ▲ APFSDS-T MS-C											
30mm APFSDS-T / TPDS-T Low Rate Initial Production (LRIP)	[Redacted]																											
30mm APFSDS-T Live Fire Test and Evaluation (LFT&E)	[Redacted]																				APFSDS-T LFT&E							
30mm HEAB-T / TP-T EMD	[Redacted]																											
30mm HEAB-T / TP-T DET Build	[Redacted]																											
30mm HEAB-T / TP-T EMD Design Engineering Test (DET)	[Redacted]																											
30mm HEAB-T / TP-T Critical Design Review (CDR)	[Redacted]																1 ▲ HEAB-T / TP-T CDR											

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) FA6 / <i>30mm Lethality</i>

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
30mm HEAB-T / TP-T DT&E Build					 HEAB-T / TP-T DT&E Build																							
30mm HEAB-T / TP-T Developmental Test & Evaluation (DT&E)					 HEAB-T/TP-T DT&E																							
30mm HEAB-T / TP-T Milestone C									 HEAB-T/TP-T MS C																			
30mm HEAB-T / TP-T Low Rate Initial Production (LRIP)													 HEAB-T / TP-T LRIP															
30mm HEAB-T Live Fire Test and Evaluation (LFT&E)																	 HEAB-T LFT&E											
30mm HEAB-T Initial Operational Test and Evaluation (IOT&E)																	 HEAB-T IOT&E											

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) FA6 / <i>30mm Lethality</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Material Development Decision (MDD)	3	2019	3	2019
30mm APFSDS-T / TPDS-T EMD Contract Award	4	2019	4	2019
30mm APFSDS-T / TPDS-T EMD	4	2019	2	2023
30mm APFSDS-T / TPDS-T DET Build	2	2020	3	2021
30mm APFSDS-T / TPDS-T Design Engineering Test (DET)	4	2021	1	2022
30mm APFSDS-T / TPDS-T Critical Design Review (CDR)	2	2022	2	2022
30mm APFSDS-T / TPDS-T DT&E Hardware Build	2	2022	4	2022
30mm APFSDS-T / TPDS-T Developmental Test & Evaluation (DT&E)	4	2022	2	2023
30mm APFSDS-T / TPDS-T Milestone C	4	2023	4	2023
30mm APFSDS-T / TPDS-T Low Rate Initial Production (LRIP)	4	2023	2	2025
30mm APFSDS-T Live Fire Test and Evaluation (LFT&E)	3	2024	1	2025
30mm HEAB-T TMRR Contract Awards	1	2019	1	2019
30mm HEAB-T Technology Maturation and Risk Reduction (TMRR)	1	2019	1	2020
30mm HEAB-T TMRR Engineering Test 1	3	2019	4	2019
30mm HEAB-T TMRR Engineering Test 2	4	2019	1	2020
30mm HEAB-T / TP-T Milestone B	2	2020	2	2020
30mm HEAB-T / TP-T EMD Contract Award	3	2020	3	2020
30mm HEAB-T / TP-T EMD	3	2020	1	2023
30mm HEAB-T / TP-T DET Build	2	2020	2	2021
30mm HEAB-T / TP-T EMD Design Engineering Test (DET)	2	2021	4	2021
30mm HEAB-T / TP-T Critical Design Review (CDR)	1	2022	1	2022
30mm HEAB-T / TP-T DT&E Build	4	2021	2	2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) FA6 / <i>30mm Lethality</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
30mm HEAB-T / TP-T Developmental Test & Evaluation (DT&E)	2	2022	4	2022
30mm HEAB-T / TP-T Milestone C	1	2023	1	2023
30mm HEAB-T / TP-T Low Rate Initial Production (LRIP)	2	2023	3	2024
30mm HEAB-T Live Fire Test and Evaluation (LFT&E)	2	2024	3	2024
30mm HEAB-T Initial Operational Test and Evaluation (IOT&E)	2	2024	3	2024

Note

- Engineering Manufacturing Development (EMD)
- Armor Piercing Fin Stabilized Discarding Sabot with Trace (APFSDS-T)
- Target Practice Discarding Sabot with Trace (TPDS-T)
- High Explosive Airburst with Trace (HEAB-T)
- Target-Practice with Trace (TP-T)
- Technology Maturation and Risk Reduction (TMRR)

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) FJ4 / Cannon-Delivered Area Effects Munitions (C-DAEM)			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
FJ4: Cannon-Delivered Area Effects Munitions (C-DAEM)	-	20.079	85.997	92.402	-	92.402	86.869	70.359	55.644	56.185	0.000	467.535
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Cannon-Delivered Area Effects Munitions (C-DAEM) Project will provide United States (U.S.) ground forces with the capability to engage area personnel through armored targets, while denying threat forces full operational freedom within the targeted area. An Analysis of Alternatives (AoA) was completed in January 2018 to inform Army acquisition and investment decisions regarding replacement of the current stockpile of 155 millimeter (mm) Dual Purpose Improved Conventional Munitions (DPICM) with Department of Defense (DoD) policy compliant munitions and address anti-armor and extended range capability requirements. The Army validated two materiel solutions for C-DAEM to be pursued in parallel to support the Army's modernization priorities; C-DAEM Armor and C-DAEM DPICM Replacement. C-DAEM Armor will destroy moved and moving self-propelled howitzers, infantry fighting vehicles and tanks. Fiscal Year (FY) 2023 funding will continue to support the development and testing of the selected C-DAEM Armor solution(s) for Urgent Materiel Release (UMR) and engineering efforts required to integrate the NavStorm-M (M-Code) Global Positioning System (GPS) Receiver into the most promising C-DAEM Armor objective materiel solution(s). C-DAEM DPICM Replacement will destroy personnel to soft-skinned targets. The Army has approved the Israeli M999 advanced anti-personnel munition, now designated the U.S. model XM1208, as the C-DAEM DPICM Replacement solution. FY 2023 funding will support the completion of XM1208 qualification activities and support engineering efforts to evaluate test data to ensure DoD policy compliance and that the round is safe, suitable and operationally effective, as well as the gathering of all statutory and regulatory requirements in support of a Milestone C.

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

	FY 2021	FY 2022	FY 2023
Title: C-DAEM Armor	-	76.773	88.258
Description: C-DAEM Armor will destroy moved and moving self-propelled howitzers, infantry fighting vehicles and tanks.			
FY 2022 Plans: FY 2022 funding supports the continued development and testing of the most promising C-DAEM Armor candidates(s) for Urgent Materiel Release (UMR) and engineering efforts required to integrate the NavStorm-M Global Positioning System (GPS) Receiver into the most promising C-DAEM Armor objective materiel solution(s).			
FY 2023 Plans: FY 2023 funding will continue to support the development and testing of the selected C-DAEM Armor solution(s) for Urgent Materiel Release (UMR) and engineering efforts required to integrate the NavStorm-M (M-Code) Global Positioning System (GPS) Receiver into the most promising C-DAEM Armor objective materiel solution(s).			
FY 2022 to FY 2023 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FJ4 / Cannon-Delivered Area Effects Munitions (C-DAEM)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
Increase in funding in FY 2023 due to increase in contract costs associated with C-DAEM Armor development and qualification efforts for selected solution(s) to support UMR and NavStorm-M (M-Code) GPS Receiver integration efforts.			
Title: C-DAEM DPICM Replacement	20.079	6.082	4.144
Description: C-DAEM DPICM Replacement will destroy personnel to soft-skinned targets. The Army has approved the Israeli M999 advanced anti-personnel munition, now designated the US model XM1208, as the C-DAEM DPICM Replacement solution.			
FY 2022 Plans: FY 2022 funding supports XM1208 testing and qualification activities to ensure effectiveness, suitability and survivability.			
FY 2023 Plans: FY 2023 funding will support the completion of XM1208 qualification activities and support engineering efforts to evaluate test data to ensure DoD policy compliance and that the round is safe, suitable and operationally effective, as well as the gathering of all statutory and regulatory requirements in support of a Milestone C.			
FY 2022 to FY 2023 Increase/Decrease Statement: Decrease in funding due to the completion of initial XM1208 test and qualification activities.			
Title: FY 2022 SBIR/STTR Transfer	-	3.142	-
Description: Funding transferred in accordance with Title 15 USC ?638			
FY 2022 Plans: Funding transferred in accordance with Title 15 USC ?638			
FY 2022 to FY 2023 Increase/Decrease Statement: Funding transferred in accordance with Title 15 USC ?638			
Accomplishments/Planned Programs Subtotals	20.079	85.997	92.402

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• FG1: Cannon-Delivered Area Effects Munitions (C-DAEM)	38.466	-	0.000	-	0.000	-	-	-	-	-	Continuing
• F90112: PROJ, ARTY, 155MM C-DAEM ARMOR	-	-	46.857	-	46.857	71.368	199.334	232.036	232.036	0.000	781.631

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FJ4 / Cannon-Delivered Area Effects Munitions (C-DAEM)
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks
In FY 2022, Project FJ4 Cannon-Delivered Area Effects Munitions (C-DAEM) transitioned from BA 4 PE 0603639A Tank and Medium Caliber Ammunition Project FG1 C-DAEM.

A Procurement of Ammunition, Army (PAA) funding line for C-DAEM Armor, Standard Study Number (SSN), F90112, PROJ, ARTY, 155MM C-DAEM ARMOR, has been established. A PAA funding line for C-DAEM DPICM Replacement, SSN E68604, PROJ, ARTY, 155MM C-DAEM INCREMENT 2, has been established.

D. Acquisition Strategy

The C-DAEM Program of Record is employing an evolutionary acquisition approach to efficiently address anti-armor, extended range capability requirements and deliver DOD unexploded ordnance (UXO) policy compliant munitions.

The Analysis of Alternatives (AoA) completed on 31 January 2018 qualified a significant enhancement of operational fires effectiveness, efficiency, and maneuver support when cannon artillery was equipped with a dedicated extended range anti-armor projectile. The U.S. Government is currently reducing risk by executing prototype testing and evaluation efforts, while utilizing the AoA results to shape the selection criteria. C-DAEM Armor used the selection criteria to sponsor competitive demonstrations for C-DAEM Armor to streamline the acquisition process. The U.S. Government has selected the most promising candidate(s) that will address medium to heavy armored targets in support of an Urgent Materiel Release (UMR) and will select the most promising candidate(s) to support Full Materiel Release (FMR). C-DAEM Armor is utilizing competitively awarded Defense Ordnance Technology Consortium (DOTC) Other Transaction Agreements (OTA) to further support development and testing of the selected C-DAEM Armor candidate(s) in accordance with the decisions granted at the Army Requirements Oversight Council (AROC) in April 2018. C-DAEM Armor is also utilizing competitively awarded DOTC OTAs to complete development and qualification activities, including the NavStorm-M (M-Code) Global Positioning System (GPS) Receiver integration efforts, in support of Milestone C for Low Rate Initial Production (LRIP) and Full Rate Production (FRP).

C-DAEM DPICM Replacement is utilizing an Irregular Warfare Technical Support Directorate (IWTSD), formerly known as Combating Terrorism Technical Support Office (CTTSO), task plan with Israel Ministry of Defense (IMOD) to deliver XM1208 hardware in support of qualification activities in accordance with decisions granted at the AROC in September 2020.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FJ4 / Cannon-Delivered Area Effects Munitions (C-DAEM)
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Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	Various	Office of the Project Manager Combat Ammunition Systems (PM CAS) : Picatinny Arsenal, NJ	-	0.027	Jul 2021	0.450	Oct 2021	0.450	Oct 2022	-		0.450	0.000	0.927	-
FY 2022 SBIR/STTR Transfer	TBD	Various : Various	-	-		3.142		-		-		-	0.000	3.142	-
Subtotal			-	0.027		3.592		0.450		-		0.450	0.000	4.069	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
DOTC - Armor Engineering and Manufacturing Development (EMD)	MIPR	DoD Ordnance Technology Consortium (DOTC) : Picatinny Arsenal, NJ	-	-		67.000	Nov 2021	75.945	Nov 2022	-		75.945	0.000	142.945	-
DOTC - Armor NavStorm-M GPS Receiver Integration	MIPR	DoD Ordnance Technology Consortium (DOTC) : Picatinny Arsenal, NJ	-	-		4.553	Nov 2021	4.010	Nov 2022	-		4.010	0.000	8.563	-
CTTSO - DPICM Replacement Hardware	MIPR	Combating Terrorism Technical Support Office (CTTSO) : Israel Ministry of Defense (IMOD)	-	14.904	Mar 2021	-		-		-		-	0.000	14.904	-
Subtotal			-	14.904		71.553		79.955		-		79.955	0.000	166.412	N/A

Remarks
Increase in C-DAEM Armor EMD contract costs due to additional hardware required to support qualification testing.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FJ4 / Cannon-Delivered Area Effects Munitions (C-DAEM)
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Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	-	2.646	Nov 2020	6.748	Nov 2021	6.153	Nov 2022	-		6.153	0.000	15.547	-
Fire Control Software Update	MIPR	Multiple : Various	-	2.502	May 2021	1.104	May 2022	-		-		-	0.000	3.606	-
Subtotal			-	5.148		7.852		6.153		-		6.153	0.000	19.153	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Armor Testing	MIPR	Army Test & Evaluation Command (ATEC) : Yuma, AZ	-	-		1.500	Mar 2022	2.500	Mar 2023	-		2.500	0.000	4.000	-
DPICM Replacement Testing	MIPR	Army Test & Evaluation Command (ATEC) : Yuma, AZ	-	-		1.500	Mar 2022	3.344	Mar 2023	-		3.344	0.000	4.844	-
Subtotal			-	-		3.000		5.844		-		5.844	0.000	8.844	N/A

Remarks
 Increase in C-DAEM Armor test costs to support additional activities required to achieve Urgent Materiel Release.
 Increase in C-DAEM DPICM Replacement test costs to support the completion of qualification activities that establish reliability as well as environmental testing to confirm that the XM1208 projectile is safe, suitable and operationally effective.

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	20.079	85.997	92.402	-	92.402	0.000	198.478	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army							Date: April 2022			
Appropriation/Budget Activity 2040 / 5			R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev			Project (Number/Name) FJ4 / Cannon-Delivered Area Effects Munitions (C-DAEM)				
	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks
 C-DAEM Armor will destroy moved and moving self-propelled howitzers, infantry fighting vehicles and tanks. C-DAEM Dual Purpose Improved Conventional Munition (DPICM) Replacement will destroy personnel to soft-skinned vehicles. C-DAEM Armor and DPICM Replacement are being pursued in parallel to support the Army's modernization priorities.

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FJ4 / Cannon-Delivered Area Effects Munitions (C-DAEM)

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				
	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	
C-DAEM Armor																													
Technology Maturation and Risk Reduction (TMRR)																													
	TMRR																												
In Process Review (IPR) #1	1																												
	IPR #1																												
IPR #2		2																											
		IPR #2																											
Acquisition Decision Memorandum (ADM)				3																									
				ADM																									
Engineering Manufacturing & Development (EMD)																													
	EMD																												
Army Requirements Oversight Council (AROC) Decision					5																								
					AROC																								
Milestone B								6																					
								MS-B																					
NavStorm-M (M-Code) GPS Receiver Integration																													
	NavStorm-M (M-Code) GPS Receiver Integration																												
Developmental, Safety and Qual Testing																													
	Developmental, Safety and Qual Testing																												
Preliminary Design Review (PDR)					4																								
					PDR																								
Hardware Fabrication																													
	Hardware Fabrication																												
Critical Design Review (CDR)									8																				
									CDR																				

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FJ4 / Cannon-Delivered Area Effects Munitions (C-DAEM)

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Urgent Materiel Release (UMR) Decision Point (DP)									9 UMR DP																			
Milestone C													11 MS-C															
C-DAEM DPICM Replacement																												
Qualification and Testing	Qual & Testing																											
Unexploded Ordnance (UXO) DP									7 UXO DP				10 MS-C															
Milestone C.													10 MS-C															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) FJ4 / <i>Cannon-Delivered Area Effects Munitions (C-DAEM)</i>

Note
In 1QFY22, the Milestone Decision Authority for C-DAEM Armor signed an Acquisition Decision Memorandum (ADM) approving the initiation of Engineering Manufacturing and Development (EMD) and Urgent Materiel Release qualification activities. The U.S. Government has selected the most promising candidate(s) that will address medium to heavy armored targets in support of UMR and will select the most promising candidate(s) to support Full Materiel Release (FMR).

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FJ4 / Cannon-Delivered Area Effects Munitions (C-DAEM)
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
C-DAEM Armor	1	2022	4	2026
Technology Maturation and Risk Reduction (TMRR)	1	2020	4	2021
In Process Review (IPR) #1	1	2021	1	2021
IPR #2	2	2021	2	2021
Acquisition Decision Memorandum (ADM)	1	2022	1	2022
Engineering Manufacturing & Development (EMD)	1	2022	4	2027
Army Requirements Oversight Council (AROC) Decision	3	2022	3	2022
Milestone B	4	2022	4	2022
NavStorm-M (M-Code) GPS Receiver Integration	1	2022	4	2025
Developmental, Safety and Qual Testing	1	2022	4	2025
Preliminary Design Review (PDR)	3	2022	3	2022
Hardware Fabrication	1	2022	4	2022
Critical Design Review (CDR)	3	2023	3	2023
Urgent Materiel Release (UMR) Decision Point (DP)	4	2023	4	2023
Milestone C	1	2026	1	2026
C-DAEM DPICM Replacement	1	2021	4	2022
Qualification and Testing	1	2021	4	2023
Unexploded Ordnance (UXO) DP	1	2023	1	2023
Milestone C.	1	2024	1	2024

Note

C-DAEM Armor will destroy moved and moving self-propelled howitzers, infantry fighting vehicles and tanks. C-DAEM Dual Purpose Improved Conventional Munition (DPICM) Replacement will destroy personnel to soft-skinned vehicles. C-DAEM Armor and DPICM Replacement are being pursued in parallel to support the Army's modernization priorities.

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army										Date: April 2022		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) FL4 / Small Caliber Ammo for Next Gen Squad Weapons			
COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
FL4: Small Caliber Ammo for Next Gen Squad Weapons	-	26.483	28.372	25.558	-	25.558	12.058	12.168	12.172	12.291	0.000	129.102
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The total cost of the Small Caliber Ammo for Next Gen Squad Weapons Middle Tier of Acquisition effort is \$132.0M million RDTE from FY2019 to FY2026. The remaining \$11.8M in FY2027 is fully funded across the Future Years Defense Program (FYDP).

A. Mission Description and Budget Item Justification

The Small Caliber Ammo for Next Gen Squad Weapons project is a critical technology development in response to the Soldier Lethality Cross Functional Team (SL CFT) Initial Capability Document (ICD) for the ammunition required to support the rapid prototyping, development, and fielding of the Next Generation Squad Weapons (NGSW) under the Middle Tier of Acquisition (MTA) authority for rapid prototyping/rapid fielding. The objective is to develop and Full Materiel Release (FMR) the new ammunition in parallel with the NGSW rifle and automatic rifle. The NGSW ammunition is split into multiple ammunition variants, the General Purpose (GP), the Special Purpose (SP), the Reduced Range Ammunition (RRA), Tracer Ammunition, Blank Ammunition, the Close Combat Mission Capability Kit (CCMCK) training ammunition, Drill Dummy Inert (DDI) cartridge, and High Pressure Test (HPT) cartridge. Fiscal Year (FY) 2023 funding supports performing optimization efforts on the GP variant. FY 2023 also supports continuing rapid prototyping for the SP projectile, manufacturing prototype ammunition required for Developmental Testing (DT), and conducting DT. FY 2023 supports continuing rapid prototyping efforts to develop RRA and RRA-Tracer for the NGSW, continuing weapon and cartridge integration efforts, and executing projectile optimization efforts. FY 2023 also supports continuing rapid prototyping effort to develop tracer ammunition for the NGSW, building and testing tracer ammunition prototypes, and maturing/refining down-selected tracer ammunition design. FY 2023 supports continuing rapid prototyping effort to mature the Blank ammunition and activities to accelerate the development/maturation of Blank ammunition designs. FY 2023 also supports continuing rapid prototyping effort to develop CCMCK training ammunition for the NGSW, building and evaluating competing CCMCK training ammunition designs/concepts, down-selecting to a CCMCK design, begin the process of maturing/refining selected design by performing engineering tests and implementing improvements based upon test results. FY 2023 also supports continuing the refining and development of the DDI and HPT cartridges.

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

	FY 2021	FY 2022	FY 2023
Title: Rapid Prototyping GP	7.983	0.500	2.012
Description: Develop, demonstrate, and qualify new ammunition for the NGSW systems.			
FY 2022 Plans: Complete GP rapid prototyping/development effort and begin GP optimization efforts.			
FY 2023 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FL4 / Small Caliber Ammo for Next Gen Squad Weapons		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
Continue GP optimization efforts and conduct developmental tests. FY 2022 to FY 2023 Increase/Decrease Statement: Funding is increased for optimization and developmental test efforts for general purpose variant in FY 2023.				
Title: Rapid Prototyping SP Description: Develop, demonstrate, and qualify new ammunition to defeat hard targets for the NGSW systems. FY 2022 Plans: Continuing rapid prototyping for the Special Purpose (SP) projectile, manufacture prototype ammunition required for safety testing, and conduct safety testing. FY 2023 Plans: Continuing rapid prototyping for the Special Purpose (SP) projectile, manufacture prototype ammunition required for developmental testing, and conduct developmental tests. FY 2022 to FY 2023 Increase/Decrease Statement: Funding is decreased in FY 2023 to support developmental test activities.		12.500	10.164	2.700
Title: Rapid Prototyping Reduced Range Ammunition (RRA) for NGSW Description: Develop and qualify RRA for the NGSW that will satisfy the requirement to provide training ammunition suitable for use on military installations with Surface Danger Zone (SDZ) restrictions. Two RRA variants will be developed under this effort - the NGSW RRA and the NGSW Reduced Range (RR) Tracer. FY 2022 Plans: Continue rapid prototyping effort to develop RRA and RR Tracer ammunition for the NGSW, conduct a Critical Design Review (CDR), and manufacture prototype ammunition required for safety testing. FY 2023 Plans: Continue rapid prototyping effort to develop RRA and RR Tracer ammunition for the NGSW, continue weapon and cartridge integration efforts, and execute projectile optimization efforts. FY 2022 to FY 2023 Increase/Decrease Statement: Funding increased in FY 2023 to support prototyping and risk reduction efforts.		3.500	8.000	10.700
Title: Rapid Prototyping Tracer Ammunition for NGSW		1.500	4.000	3.396

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FL4 / Small Caliber Ammo for Next Gen Squad Weapons		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>Description: Rapid prototyping effort to develop and field tracer ammunition for the NGSW systems by building and evaluating competing tracer ammunition designs/concepts then down-selecting to a final tracer design.</p> <p>FY 2022 Plans: Continue rapid prototyping effort to develop tracer ammunition for the NGSW, conduct a Preliminary Design Review (PDR), build and test tracer ammunition prototypes, and mature/refine down-selected tracer ammunition design.</p> <p>FY 2023 Plans: Continue rapid prototyping effort to develop tracer ammunition for the NGSW, build and test tracer ammunition prototypes, and mature/refine down-selected tracer ammunition design.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding reduced for Planned Tracer development activities in FY 2023.</p>				
<p>Title: Concept Evaluation of other NGSW Ammunition Variants</p> <p>Description: Concept development/evaluation of follow-on variants / ammunition for the NGSW.</p>		1.000	-	-
<p>Title: Rapid Prototyping Blank Ammo</p> <p>Description: Rapid prototyping effort to develop and field blank ammunition for the NGSW systems by building and evaluating competing blank ammunition designs/concepts then down-selecting to a final blank design.</p> <p>FY 2022 Plans: Continue rapid prototyping effort to mature the Blank ammunition and perform activities to accelerate the development/maturation of Blank ammunition designs.</p> <p>FY 2023 Plans: Continue rapid prototyping effort to mature the Blank ammunition and perform activities to accelerate the development/maturation of Blank ammunition designs.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Increased funding for planned Blank Ammunition development activities in FY 2023.</p>		-	2.000	2.500
<p>Title: Rapid Prototyping CCMCK Training Ammo</p> <p>Description: Rapid prototyping effort to develop training ammunition for the NGSW systems by building and evaluating competing CCMCK training ammunition designs/concepts then down-selecting to a final design.</p>		-	2.122	2.500

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FL4 / Small Caliber Ammo for Next Gen Squad Weapons		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2021	FY 2022	FY 2023
<p>FY 2022 Plans: Start rapid prototyping effort to develop CCMCK training ammunition for the NGSW, building and evaluate CCMCK training ammunition designs/concepts, mature/refine selected design/designs by performing engineering tests and implementing improvements based upon test results.</p> <p>FY 2023 Plans: Continue rapid prototyping effort to develop CCMCK training ammunition for the NGSW, building and evaluate CCMCK training ammunition designs/concepts, mature/refine selected design/designs by performing engineering tests and implementing improvements based upon test results.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding increased for planned CCMCK training ammunition activities in FY 2023.</p>				
<p>Title: Rapid Prototyping DDI and HPT Cartridges</p> <p>Description: Rapid prototyping effort to develop and field DDI and HPT cartridges NGSW weapon systems.</p> <p>FY 2022 Plans: Begin rapid prototyping activities to mature the DDI and HPT cartridges by building and evaluating competing DDI and HPT cartridge designs/concepts, maturing/refining selected design/designs by performing engineering tests and implementing improvements based upon test results.</p> <p>FY 2023 Plans: Continue rapid prototyping activities to mature the DDI and HPT cartridges by building and evaluating competing DDI and HPT cartridge designs/concepts, maturing/refining selected design/designs by performing engineering tests and implementing improvements based upon test results.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Funding increase for planned DDI and HPT cartridge activities in FY 2023.</p>		-	0.550	1.750
<p>Title: Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR)</p> <p>FY 2022 Plans: FY 2022 funding to be assess per SBIR Title 15 USC ?638(f)(1) and STTR Title 15 USC ?638(f)(1)(A).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: Allocation of FY 2022 SBIR/STTR was added. FY 2023 SBIR/STTR transfer amount will be determined and assessed in FY 2023.</p>		-	1.036	-
Accomplishments/Planned Programs Subtotals		26.483	28.372	25.558

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army	Date: April 2022
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FL4 / Small Caliber Ammo for Next Gen Squad Weapons
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u> <u>Base</u>	<u>FY 2023</u> <u>OCO</u>	<u>FY 2023</u> <u>Total</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>FY 2027</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• E06002: NEXT GENERATION COMBAT ROUND	14.386	59.496	23.523	-	23.523	36.816	39.040	71.884	71.876	0.000	317.021
• E06014: NEXT GENERATION REDUCED RANGE ROUND	-	4.807	74.209	-	74.209	110.093	115.058	171.792	171.792	0.000	647.751
• E06015: NEXT GENERATION SQUAD WEAPON SPECIAL PURPOSE ROUND	-	3.369	7.858	-	7.858	14.859	22.058	34.870	34.869	0.000	117.883
• E60011: NEXT GENERATION BLANK ROUND	-	3.562	23.072	-	23.072	34.378	34.590	65.720	65.720	0.000	227.042

Remarks
Procurement of Ammunition, Army E06002, E06014, E06015, and E60011: These funding lines supports the procurement of ammunition for the NGSW.

D. Acquisition Strategy

The NGSW ammunition program will utilize the Middle Tier of Acquisition (MTA) authority for rapid prototyping/rapid fielding to develop ammunition concepts/designs for the GP variant and the SP variant. The project will utilize Government developed projectile designs that will be delivered to development contractors as Government Furnished Material (GFM). The Government will select up to three contractors for the weapon system development and down-select to a single contractor in FY 2021, prior to production contract award; with a planned Urgent Materiel Release (UMR) in FY 2022 and FMR in FY 2024. Development effort for the Reduced Range and Tracer ammunition will follow a similar strategy beginning in FY 2021. Follow-on development efforts for additional NGSW ammunition variants including blank, CCMCK ammunition, DDI cartridge, and HPT cartridge will start in FY 2022.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				FL4 / Small Caliber Ammo for Next Gen Squad Weapons							
Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
SBIR/STTR Transfer	TBD	Various : Various	-	-		1.036	Mar 2022	-		-		-	0.000	1.036	-
Subtotal			-	-		1.036		-		-		-	0.000	1.036	N/A
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Follow-on Ammo Prototypes/Concepts	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	-	0.200	Feb 2021	-		-		-		-	Continuing	Continuing	Continuing
Projectile and Ammo Development Contract General Purpose	Option/CPFF	OLIN Winchester Corporation (LCAAP) : Independence, Missouri	1.740	2.400	Apr 2021	-		-		-		-	Continuing	Continuing	Continuing
Projectile and Ammo Development Contract General Purpose	Option/CPFF	Northrop Grumman Innovation Systems (NGIS) LCAAP : Independence, Missouri	7.189	-		-		-		-		-	0.000	7.189	-
Projectile and Ammo Development Contract Special Purpose	Option/CPFF	OLIN Winchester Corporation (LCAAP) : Independence, Missouri	2.033	5.400	May 2021	5.000	Dec 2021	0.500	Dec 2022	-		0.500	Continuing	Continuing	Continuing
Ammo Development Support Special Purpose	Option/CPFF	Concurrent Technologies Corporation (CTC) : Johnstown, Pennsylvania	0.862	-		-		-		-		-	0.000	0.862	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				FL4 / Small Caliber Ammo for Next Gen Squad Weapons							
Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Tracer Ammunition Prototype Contract	Option/CPFF	JAK Tool Engineering Solutions : Cranbury, New Jersey	-	0.750	May 2021	1.000	Jan 2022	1.200	Jan 2023	-		1.200	Continuing	Continuing	Continuing
Reduced Range Ammunition Prototype Contract 1	Option/CPFF	JAK Tool Engineering Solutions : Cranbury, New Jersey	-	1.000	Feb 2021	2.200	Jan 2022	2.000	Jan 2023	-		2.000	Continuing	Continuing	Continuing
Reduced Range Ammunition Prototype Contract 2	Option/FFP	OLIN Winchester Corporation : Independence, Missouri	-	1.000	Apr 2021	2.200	Jan 2022	-		-		-	Continuing	Continuing	Continuing
Reduced Range Ammo Development	Option/CPFF	Concurrent Technologies Corporation (CTC) : Johnstown, Pennsylvania	-	-		-		0.500	Oct 2022	-		0.500	Continuing	Continuing	Continuing
Reduced Range Ammo Weapon Integration	TBD	To Be Determined : To Be Determined	-	-		-		4.500	Feb 2023	-		4.500	Continuing	Continuing	Continuing
General Purpose Optimization	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	-	-		0.500	Nov 2021	0.500	Nov 2022	-		0.500	Continuing	Continuing	Continuing
Blank Ammo Development Contracts	TBD	To Be Determined : To Be Determined	-	-		1.000	Feb 2022	1.000	Feb 2023	-		1.000	Continuing	Continuing	Continuing
CCMCK Training Ammo Development Contracts	TBD	To Be Determined : To Be Determined	-	-		1.000	Feb 2022	1.000	Feb 2023	-		1.000	Continuing	Continuing	Continuing
DDI and HPT Development Contracts	TBD	To Be Determined : To Be Determined	-	-		0.400	Feb 2022	1.000	Feb 2023	-		1.000	Continuing	Continuing	Continuing
Subtotal			11.824	10.750		13.300		12.200		-		12.200	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) FL4 / Small Caliber Ammo for Next Gen Squad Weapons							
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Tracer Ammunition Development and Support	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	-	0.350	May 2021	1.000	Feb 2022	1.446	Nov 2022	-		1.446	Continuing	Continuing	Continuing
Reduced Range Ammunition Prototype and Support	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	0.050	1.000	Dec 2020	1.700	Nov 2021	1.700	Nov 2022	-		1.700	Continuing	Continuing	Continuing
Projectile Development and Support General Purpose	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	2.080	2.083	Feb 2021	-		1.012	Nov 2022	-		1.012	0.000	5.175	-
Projectile Development and Support Special Purpose	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	-	5.150	Feb 2021	2.500	Nov 2021	1.700	Nov 2022	-		1.700	Continuing	Continuing	Continuing
Blank Ammo Development and Support	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	-	-		0.650	Nov 2021	1.000	Nov 2022	-		1.000	Continuing	Continuing	Continuing
Blank Ammo Development and Support	MIPR	Army Research Lab (ARL) : Aberdeen, Maryland	-	-		0.300	Nov 2021	0.500	Nov 2022	-		0.500	Continuing	Continuing	Continuing
CCMCK Training Development and Support	MIPR	Development Command Armaments Center	-	-		0.647	Nov 2021	1.000	Nov 2022	-		1.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				FL4 / Small Caliber Ammo for Next Gen Squad Weapons							
Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
		(DEVCOM-AC) : Picatinny Arsenal, New Jersey													
CCMCK Training Ammo Development and Support	MIPR	Army Research Lab (ARL) : Aberdeen, Maryland	-	-		0.200	Nov 2021	0.500	Nov 2022	-		0.500	Continuing	Continuing	Continuing
DDI and HPT Development and Support	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	-	-		0.150	Nov 2021	0.750	Nov 2022	-		0.750	Continuing	Continuing	Continuing
Subtotal			2.130	8.583		7.147		9.608		-		9.608	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
U.S. Army Aberdeen Test Center (ATC) General Purpose	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	-	0.900	May 2021	-		0.500	Jan 2023	-		0.500	Continuing	Continuing	Continuing
U.S. Army Aberdeen Test Center (ATC) Special Purpose	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	-	0.500	May 2021	-		0.500	Jan 2023	-		0.500	Continuing	Continuing	Continuing
Army Research Lab (ARL) Testing General Purpose	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	0.800	1.300	Nov 2020	-		-		-		-	0.000	2.100	-
Army Research Lab (ARL) Testing Special Purpose	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	-	1.250	Nov 2020	1.100	Dec 2021	-		-		-	Continuing	Continuing	Continuing
Tracer Ammunition Engineering Tests	MIPR	Development Command Armaments Center (DEVCOM-AC) :	-	0.400	May 2021	0.300	Dec 2021	-		-		-	Continuing	Continuing	Continuing

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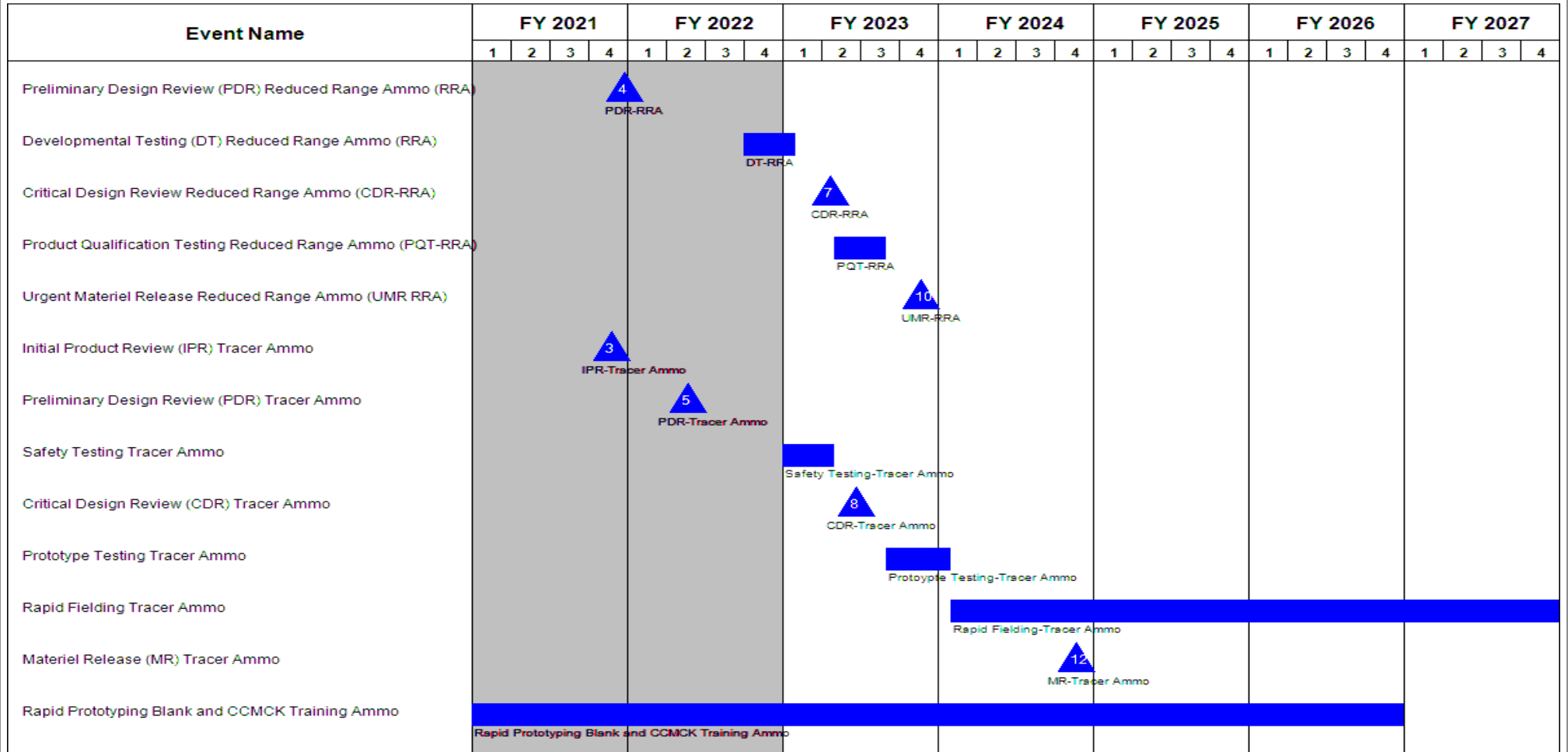
Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				FL4 / Small Caliber Ammo for Next Gen Squad Weapons							
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
		Picatinny Arsenal, New Jersey													
Reduced Range Ammunition Prototype Testing	MIPR	U.S. Army Aberdeen Test Center (ATC) : Aberdeen, Maryland	-	0.500	Feb 2021	0.500	Dec 2021	1.000	Dec 2022	-		1.000	Continuing	Continuing	Continuing
Engineering Tests General Purpose	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	-	1.300	Feb 2021	-		-		-		-	0.000	1.300	-
Engineering Tests Special Purpose	MIPR	Development Command Armaments Center (DEVCOM-AC) : Picatinny Arsenal, New Jersey	-	1.000	Feb 2021	0.964	Nov 2021	-		-		-	Continuing	Continuing	Continuing
Safety Tests Special Purpose	MIPR	U.S. Army Aberdeen Test Center (ATC) : Aberdeen, Maryland	-	-		0.500	Jan 2022	-		-		-	Continuing	Continuing	Continuing
Independent Tests Special Purpose	MIPR	Joint Munitions Command/ Ballistics Services Organization : Independence, Missouri	-	-		0.100	Apr 2022	-		-		-	Continuing	Continuing	Continuing
Independent Tests Reduced Range	MIPR	Joint Munitions Command/ Ballistics Services Organization : Independence, Missouri	-	-		0.100	Apr 2022	-		-		-	Continuing	Continuing	Continuing
Army Research Lab (ARL) Testing Reduced Range	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	-	-		1.000	Dec 2021	1.000	Dec 2022	-		1.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army												Date: April 2022			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				FL4 / Small Caliber Ammo for Next Gen Squad Weapons							
Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 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
Independent Tests Tracer	MIPR	Joint Munitions Command/ Ballistics Services Organization : Independence, Missouri	-	-		0.100	Apr 2022	-		-		-	Continuing	Continuing	Continuing
Army Research Lab (ARL) Testing Tracer	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	-	-		1.000	Dec 2021	0.500	Dec 2022	-		0.500	Continuing	Continuing	Continuing
Engineering Tests Tracer	MIPR	U.S. Army Aberdeen Test Center (ATC) : Aberdeen, Maryland	-	-		0.900	Jan 2022	0.250	Jan 2023	-		0.250	Continuing	Continuing	Continuing
Blank Ammo Engineering Tests	MIPR	Joint Munitions Command/ Ballistics Services Organization : Independence, Missouri	-	-		0.050	Apr 2022	-		-		-	Continuing	Continuing	Continuing
CCMCK Training Ammo Engineering Tests BSO	MIPR	Joint Munitions Command/ Ballistics Services Organization : Independence, Missouri	-	-		0.075	Apr 2022	-		-		-	Continuing	Continuing	Continuing
CCMCK Training Ammo Engineering Tests ARL	MIPR	Army Research Lab (ARL) : Aberdeen, Maryland	-	-		0.200	Dec 2021	-		-		-	Continuing	Continuing	Continuing
Subtotal			0.800	7.150		6.889		3.750		-		3.750	Continuing	Continuing	N/A
Project Cost Totals			14.754	26.483		28.372		25.558		-		25.558	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FL4 / Small Caliber Ammo for Next Gen Squad Weapons



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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FL4 / Small Caliber Ammo for Next Gen Squad Weapons

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Rapid Prototyping DDI and HPT Cartridges																												
Rapid Prototyping DDI and HPT Cartridges																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) FL4 / <i>Small Caliber Ammo for Next Gen Squad Weapons</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Rapid Prototyping Effort	1	2019	2	2024
Initial Product Review 1 (IPR 1) Special Purpose	2	2019	2	2019
Preliminary Design Review General Purpose (PDR-GP)	3	2019	3	2019
Initial Product Review 2 (IPR 2) Special Purpose	4	2019	4	2019
Preliminary Design Review General Purpose (PDR-SP)	2	2020	2	2020
Critical Design Review General Purpose (CDR-GP)	3	2020	3	2020
Prototype Test 1	3	2020	4	2020
Initial Product Review 3 (IPR 3) Special Purpose	4	2020	4	2020
Full Materiel Release (FMR) Transitions from BA04 EC2 to BA05 FL4	2	2021	2	2021
Critical Design Review Special Purpose (CDR-SP)	2	2021	2	2021
Prototype Test 2	2	2021	3	2021
Live Fire Test and Evaluation (LFT&E)	2	2021	3	2021
Prototype & Manufacturing Integration (GP & SP)	4	2021	2	2023
Urgent Materiel Release General Purpose (UMR GP)	4	2022	4	2022
Rapid Fielding GP	4	2022	4	2027
Production Qualification Test Special Purpose (PQT SP)	1	2023	2	2023
Urgent Materiel Release Special Purpose (UMR SP)	3	2023	3	2023
Rapid Fielding SP	3	2023	4	2027
Full Materiel Release (FMR) (GP and SP)	2	2024	2	2024
Initial Product Review (IPR) Reduced Range Ammo (RRA)	4	2020	4	2020
Prototype Manufacturing Reduced Range Ammo (RRA)	1	2021	3	2022
Preliminary Design Review (PDR) Reduced Range Ammo (RRA)	4	2021	4	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FL4 / Small Caliber Ammo for Next Gen Squad Weapons
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Events	Start		End	
	Quarter	Year	Quarter	Year
Developmental Testing (DT) Reduced Range Ammo (RRA)	4	2022	1	2023
Critical Design Review Reduced Range Ammo (CDR-RRA)	2	2023	2	2023
Product Qualification Testing Reduced Range Ammo (PQT-RRA)	2	2023	3	2023
Urgent Materiel Release Reduced Range Ammo (UMR RRA)	4	2023	4	2023
Initial Product Review (IPR) Tracer Ammo	4	2021	4	2021
Preliminary Design Review (PDR) Tracer Ammo	2	2022	2	2022
Safety Testing Tracer Ammo	1	2023	2	2023
Critical Design Review (CDR) Tracer Ammo	2	2023	2	2023
Prototype Testing Tracer Ammo	3	2023	1	2024
Rapid Fielding Tracer Ammo	1	2024	4	2027
Materiel Release (MR) Tracer Ammo	4	2024	4	2024
Rapid Prototyping Blank and CCMCK Training Ammo	4	2020	4	2026
Rapid Prototyping DDI and HPT Cartridges	1	2022	4	2026

Note

- Special Purpose (SP)
- General Purpose (GP)
- Close Combat Mission Capability Kit (CCMCK)
- Drill Dummy Inert (DDI)
- High Pressure Test (HPT)

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) S36 / Precision Guidance Kit
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
S36: Precision Guidance Kit	-	32.147	35.494	29.838	-	29.838	5.131	3.413	3.414	3.448	0.000	112.885
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Long Range-Precision Guidance Kit (LR-PGK) XM1171/XM1172 development effort will qualify state of the art technologies for a course correcting fuze that provides precision accuracy at extended ranges for current and future 155 millimeter (mm) High Explosive (HE) projectiles by eliminating a portion of the inherent errors associated with ballistic firing solutions, which effectively reduces the number of projectiles required to execute fire missions. LR-PGK will support projectile operation in Global Positioning System (GPS) degraded environments and compatibility with Army Modernization objectives under the Long Range Precision Fires Cross Functional Team's (LRPF CFT) new long range cannon, Extended Range Cannon Artillery (ERCA) Self-Propelled Howitzer (SPH). The ERCA and its new long range projectiles require the LR-PGK to meet lethality requirements. Fiscal Year (FY) 2023 funding supports the build and safety and development testing of the LR-PGK Urgent Materiel Release (UMR) configuration as well as development of the Full Materiel Release (FMR) design configuration.

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

	FY 2021	FY 2022	FY 2023
<p>Title: Long Range-Precision Guidance Kit (LR-PGK) Development</p> <p>Description: The LR-PGK development effort will qualify state of the art technologies for operation in GPS degraded environments as well as ensure compatibility with the Extended Range Cannon Artillery (ERCA) weapon and projectiles to meet Army Modernization objectives under the Long Range Precision Fires Cross Functional Team (LRPF CFT).</p> <p>FY 2022 Plans: EMD activities including prototype testing, tactical guided flight testing in the threat environment, and fabrication of developmental test hardware.</p> <p>FY 2023 Plans: Safety and development testing of the LR-PGK Urgent Materiel Release (UMR) configuration as well as development of the Full Materiel Release (FMR) design configuration.</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement: FY 2023 funding decreases with GPS System Maturation being funded under System development contract.</p>	32.147	34.197	29.838
<p>Title: Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR)</p> <p>FY 2022 Plans: FY 2022 funding to be assess per SBIR Title 15 USC ?638(f)(1) and STTR Title 15 USC ?638(f)(1)(A).</p> <p>FY 2022 to FY 2023 Increase/Decrease Statement:</p>	-	1.297	-

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Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) S36 / Precision Guidance Kit

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2021	FY 2022	FY 2023
FY 2023 SBIR/STTR to be assessed within year of execution.			
Accomplishments/Planned Programs Subtotals	32.147	35.494	29.838

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

Line Item	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
• E99251: LONG-RANGE PRECISION GUIDANCE KIT (LR-PGK)	-	24.677	37.891	-	37.891	33.793	82.653	78.707	85.427	0.000	343.148

Remarks

A Procurement of Ammunition, Army (PAA) funding for Long Range-Precision Guidance Kit (LR-PGK), Standard Study Number (SSN) E99251, was established for this effort to transition to deliver Safety Release quantities for First Unit Issued (FUI) in support of the Extended Range Cannon Artillery (ERCA) Operational Assessment (OA) as well as future Urgent Material Release (UMR) and Full Material Release (FMR) quantities.

Program Element (PE) 0604802A, Project EU6, 155mm Rocket Assisted Projectile Extended Range FY 2021 Congressional Add knowledge points are being utilized to support long range precision fuze development efforts, and provide a risk mitigation alternative to support the ERCA System of Systems OA.

D. Acquisition Strategy

Long Range-Precision Guidance Kit (LR-PGK) XM1171/XM1172 development efforts are focused on addressing performance in Global Positioning System (GPS) degraded environments as well as ensuring compatibility with the Army's new long range 155mm cannon and projectiles, which are scheduled to be fielded in the same timeframe as LR-PGK. The initial contracting strategy included competitive DoD Ordnance Technology Consortium (DOTC) Other Transaction Agreement (OTA) concept development efforts with multiple contractors in Fiscal Year (FY) 2017, followed by a DOTC Risk Reduction concept maturation phase in FY 2018 through FY 2019. This developmental program has the objective to develop and safety qualify an initial XM1172 configuration to support the FY 2024 Extended Range Cannon Artillery (ERCA) Operational Assessment and a follow-on Urgent Material Release (UMR). This overlaps with the development of the M1171/M1172 configurations for Full Material Release (FMR). The FMR qualification effort will take place in FY 2025 to support Milestone C, in FY 2026. The program will transition to a Federal Acquisition Regulation (FAR) based production contract to support the XM1172 UMR deliveries in FY 2024 and FY 2025. Subsequent to Milestone C the program will transition to a FAR based contract for Low Rate Initial Production (LRIP) in FY 2026 and Full Rate Production (FRP) in FY 2027 to support the delivery of the M1171/ M1172 FMR configuration quantities.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) S36 / Precision Guidance Kit
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Management Services (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Office	Various	Office of the Project Manager (PM) Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ	14.017	0.026	Oct 2020	0.075	Oct 2021	0.100	Oct 2022	-		0.100	0.000	14.218	14.067
Small Business Innovation Research (SBIR)/ Small Business Technology Transfer (STTR)	TBD	Various : N/A	-	-		1.297	Mar 2022	-		-		-	0.000	1.297	-
Subtotal			14.017	0.026		1.372		0.100		-		0.100	0.000	15.515	N/A

Product Development (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
LR-PGK Engineering and Manufacturing Development (EMD)	MIPR	Other Transaction Agreement (OTA) : TBS	22.329	18.264	Feb 2021	27.003	Nov 2021	23.058	Nov 2022	-		23.058	0.000	90.654	33.046
LR-PGK GPS System Maturation	MIPR	DOD Ordnance Consortium (DOTC) / L3-IEC : Various	17.412	6.342	Dec 2020	2.794	Dec 2021	-		-		-	0.000	26.548	10.551
LR-PGK Software Engineering	Reqn	Leidos, Inc. : Reston, VA	-	0.699	Sep 2021	0.700	Aug 2022	0.705	Aug 2023	-		0.705	0.000	2.104	-
Developmental Hardware	Reqn	American Ordnance, LLC : Middletown, IA	-	0.020	Sep 2021	0.095	Apr 2022	0.250	Mar 2023	-		0.250	0.000	0.365	-
Subtotal			39.741	25.325		30.592		24.013		-		24.013	0.000	119.671	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army **Date:** April 2022

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) S36 / Precision Guidance Kit
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Support (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Engineering Support	MIPR	Combat Capabilities Development Command Armaments Center (DEVCOM AC) : Picatinny Arsenal, NJ	41.557	5.643	Dec 2020	3.030	Oct 2021	3.295	Oct 2022	-		3.295	0.000	53.525	41.412
Subtotal			41.557	5.643		3.030		3.295		-		3.295	0.000	53.525	N/A

Test and Evaluation (\$ in Millions)				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System Development Testing	MIPR	Army Test and Evaluation Command (ATEC) Yuma Proving Ground (YPG) : Yuma, AZ	10.442	1.153	Jul 2021	0.500	May 2022	2.430	Nov 2022	-		2.430	0.000	14.525	10.442
Subtotal			10.442	1.153		0.500		2.430		-		2.430	0.000	14.525	N/A

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		105.757	32.147	35.494	29.838	-	29.838	0.000	203.236	N/A

Remarks
 Defense Ordnance Technology Consortium (DOTC)
 Long Range-Precision Guidance Kit (LR-PGK)
 Engineering and Manufacturing Development (EMD)
 Army Test and Evaluation Command (ATEC)

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Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) S36 / Precision Guidance Kit

Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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
Technology Maturation and Risk Reduction (TMRR) and EMD																												
TMRR/ EMD																												
Prototype Development & Testing																												
Prototyping & Testing																												
Preliminary Design Review (PDR)									2 PDR																			
Critical Design Review (CDR)													4 CDR															
Development Testing																												
Development Testing																												
Milestone B													5 MS-B															
UMR													6 UMR															
UMR Deliveries																												
UMR Deliveries																												
Full Materiel Release (FMR) Qualification Testing																												
FMR Qualification Testing																												
Milestone C																					7 MS-C							
Initial Operation Test and Evaluation (IOT&E)																									8 IOT&E			
FMR																									9 FMR			
ERCA System of Systems (SoS) Operational Assessment (OA)																												

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Event Name	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027							
	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				
ERCA SoS OA Deliveries													ERCA SoS OA Deliveries																			
Safety Release for ERCA First Unit Issued (FUI)													3				Safety Release for ERCA FUI															
ERCA SoS OA																	ERCA SoS OA															

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Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) S36 / Precision Guidance Kit

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Technology Maturation and Risk Reduction (TMRR) and EMD	1	2019	2	2026
Prototype Development & Testing	2	2020	3	2023
Preliminary Design Review (PDR)	3	2023	3	2023
Critical Design Review (CDR)	2	2024	2	2024
Development Testing	3	2023	2	2024
Milestone B	2	2024	2	2024
UMR	3	2024	3	2024
UMR Deliveries	2	2025	2	2026
Full Materiel Release (FMR) Qualification Testing	2	2024	2	2026
Milestone C	2	2026	2	2026
Initial Operation Test and Evaluation (IOT&E)	1	2027	1	2027
FMR	2	2027	2	2027
ERCA System of Systems (SoS) Operational Assessment (OA)	2	2022	2	2022
ERCA SoS OA Deliveries	4	2023	4	2024
Safety Release for ERCA First Unit Issued (FUI)	4	2023	4	2023
ERCA SoS OA	1	2024	4	2024

Note

Engineering and Manufacturing Development (EMD)