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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Army											Date: February 2016	
Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603639A / Tank and Medium Caliber Ammunition							
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	-	24.402	46.749	40.096	-	40.096	46.663	50.914	29.886	17.711	Continuing	Continuing
656: 120mm Cartridge (Advanced Multipurpose-AMP)	-	14.179	27.578	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	41.757
694: Medium Caliber Ammunition	-	0.000	0.000	2.170	-	2.170	0.000	0.000	0.000	0.000	Continuing	Continuing
EB8: OWL for Small Caliber Ammunition	-	2.391	2.500	2.166	-	2.166	4.400	4.400	0.000	0.000	Continuing	Continuing
EB9: Tunable Pyrotechnic Aircraft Countermeasure Flares	-	0.850	3.000	2.368	-	2.368	0.000	0.000	0.000	0.000	0.000	6.218
EC2: Adv Armor-Piercing (ADVAP) for Small Cal Ammo	-	5.280	7.700	0.000	-	0.000	3.800	6.900	0.000	0.000	Continuing	Continuing
EC3: Ammunition Logistics Prototyping	-	1.702	3.571	2.017	-	2.017	2.258	2.825	2.478	1.826	0.000	16.677
EL6: Individual Assault Munition (IAM)	-	0.000	0.000	0.000	-	0.000	1.896	8.469	10.980	0.000	0.000	21.345
EL7: Reduced Range Small Caliber Training Ammunition	-	0.000	0.000	2.166	-	2.166	9.000	13.500	0.000	0.000	Continuing	Continuing
EL8: LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER	-	0.000	2.400	1.280	-	1.280	2.500	0.000	0.000	0.000	Continuing	Continuing
EU1: Enhanced Lethality Cannon Munitions	-	0.000	0.000	9.866	-	9.866	10.000	0.000	0.000	0.000	0.000	19.866
EU2: Improved Multi-Option Fuze (iMOFA/iMOFM)	-	0.000	0.000	7.892	-	7.892	0.000	0.000	0.000	0.000	0.000	7.892
EU3: .50 Caliber All-Purpose Tactical Cartridge (APTC)	-	0.000	0.000	0.000	-	0.000	0.000	0.000	4.600	8.060	0.000	12.660
FA5: Assured Precision Weapons and Munitions	-	0.000	0.000	10.171	-	10.171	12.809	14.820	11.828	7.825	0.000	57.453

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<b>Note</b> In FY 2017, PE 0603639A projects 694, EL7, EU1, EU2 and FA5 are new start programs.		
<b>A. Mission Description and Budget Item Justification</b> Title changed from Tank and Medium Caliber Ammunition to Weapons and Munitions Advanced Development.  The Weapons and Munitions Advanced Development Program Element (PE) encompasses a comprehensive program to develop, rapidly transition to production, and field advanced weapons and munitions. These programs will ensure continued battlefield overmatch and lethality of U.S. maneuver forces against the full range of modern battlefield threats. To achieve this, Weapons and Munitions Engineering Development Program will identify and develop promising technologies through competitive development and streamlined acquisition procedures.  Project 652: The M829E4 cartridge is an Abrams delivered Line of Sight (LOS) munition that will provide capability for the current force Armored Brigade Combat Team's (ABCT) commander to conduct decisive operations and destroy current and future enemy Main Battle Tanks (MBTs) equipped with Explosive Reactive Armor (ERA) and Active Protective System (APS) at ranges from 0-2km (T) and 0-4km (O). The M829E4 equips ABCT commanders with a unique capability which will increase the ABCT's lethality and ability to seize the initiative during unified land operations. After an Engineering and Manufacturing Development (EMD) Phase I competitive shoot off in FY 2011, Alliant Techsystems (ATK) was awarded the option to continue with Phase II until its conclusion in FY 2015. FY 2012 supported the continuation of Phase II of the M829E4 cartridge. FY 2013 funding supported design finalization, design verification, fabrication and initial testing of Developmental Test and Evaluation (DT&E) hardware. The full performance of the M829E4 is obtained with an Abrams equipped with an Ammunition Data Link breach modification. FY 2014 supported hardware and performance testing, mandated Live Fire Test & Evaluation (LFT&E) and completion of Milestone C. FY 2015 supported qualifying a second source for the composite sabot material. The current single source supplier for this material had significantly increased the cost for this material, more than doubled in cost, and expressed intentions of possibly getting out of this business. Qualification of this second source has occurred and has resulted in competitive pricing thus driving down the unit price cost. The aforementioned selection has mitigated the risk of the current supplier exiting as a supplier of this material.  Project 656: The Advanced Multi Purpose (AMP) program is a direct fire line of sight 120mm large caliber munition under development for the Abrams Main Battle Tank. It has three modes of operation including point detonate, point detonate delay and airburst. AMP is the material solution for breaching double reinforced concrete walls and defeating Anti Tank Guided Missile (ATGM) teams from 50m to 2000m (T) and 50m to 4500m (O), a validated gap that cannot currently be met with existing stockpiled ammunition. In addition to added capability, AMP will also consolidate the capabilities of four existing stockpiled 120mm munitions, thereby addressing the users' battlecary dilemma by allowing them to load a single munition that is capable of defeating multiple targets including ATGM teams, reinforced walls, personnel, light armor, bunkers, and obstacles. The full performance of the AMP is obtained with an Abrams equipped Ammunition Data Link breach modification, the same required by the 120mm M829E4 cartridge that achieved Milestone C in FY 2014. FY 2016 supports multiple contracts with competing prototypes in Phase 1 of 2 for Engineering and Manufacturing Development (EMD).  Project 694: The 40mm Low Velocity (LV) Increased Range Anti-Personnel (IRAP) tactical cartridge allows the warfighter to effectively engage multiple targets, at increased ranges using the 40mm M203 and M320 Grenade Launchers. The IRAP 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 at increased ranges with greater accuracy and lethality. When		

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2017 Army	<b>Date:</b> February 2016
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<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army I BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>
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deployed against point and area targets, the cartridge inflicts incapacitating effects against personnel or achieve a mobility kill against unarmored vehicles at increased ranges beyond those offered by the current M433 High Explosive Dual Purpose (HEDP) cartridge. IRAP is a new capability identified as a Warfighter requirement in the Capability Development Document, 40mm, Low Velocity Family of Ammunition Annex A1, Increased Range Anti-Personnel Cartridge. The cartridge provides lethal effects against targets with improved accuracy and greater standoff ranges increasing Soldier Survivability. FY 2017 supports Milestone B approval, Request for Proposal (RFP) preparation, Source Selection Planning, Government Technical Development and Cooperative Research and Development Agreement (CRADA) Testing. Engineering, Manufacturing Development will commence in FY 2017.

Project EB8: The One Way Luminescence (OWL) program is a critical technology development in response to the 7.62mm, 5.56mm, and .50 Caliber Family of Ammunition Capabilities Development Documents (CDD). Current small caliber ammunition tracer rounds are a pyrotechnic tracer mix allowing enemy forces to see the trace round and track its trajectory back to the shooter. The OWL program objective develops and fields a full day/night 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. 7.62mm is the immediate focus followed by 5.56mm and .50 caliber OWL cartridges. FY 2017 funding supports maturation and downselect of the 7.62mm OWL technology, procurement of bullet components, "tracer" material and testing evaluation in order to attain a Technology Readiness Level (TRL) of 6. FY 2017 funding further supports EMD contract development necessary for a FY 2018 Milestone B.

Project EB9: This project is essential to support the advanced development activities and technology demonstrations of the Aviation Airborne Expendable Countermeasure (AAECM) components and prototype munition decoys necessary to address emerging threat deficiencies in Army aircraft protection and the safety of its aircrews against advanced Man-Portable Air Defense Systems (MANPADS) and shoulder launched Surface-to-Air Missiles (SAM) systems. These efforts will evaluate integrated technologies and countermeasure prototype systems in realistic operating test environments to help expedite technology transition from the laboratory to operational use to demonstrate component and subsystem maturity prior to integration into major and complex Army aircraft platforms. These expendable countermeasures systems are an essential part of survivability equipment for Army aircraft. Army RDT&E efforts are coordinated with the PEO Aviation and its platform PMs with PM Aircraft Survivability Equipment (ASE) to address emerging JUONS from theatre.

Project EC2: The Advanced Armor-Piercing (ADVAP) program is a critical technology development in response to the 7.62mm and 5.56mm Family of Ammunition Capabilities Development Documents (CDD). The nomenclature for the 7.62mm ADVAP is now XM1158 and the companion trace is XM1159. The overall objective of the ADVAP program is to develop and Full Materiel Release (FMR) a 7.62mm XM1158 cartridge linked 4:1 with a trace cartridge (XM1159) followed by a 5.56mm cartridge variant that will provide overmatch capability to defeat advanced light armored threats within typical machine gun ranges. The 7.62mm XM1158 and XM1159 cartridge will be optimized for use in the M240 Machine Gun.

Project EC3: The Ammunition Logistics Prototyping 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, 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.

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<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	
<p>Project EL7: The Reduced Range Small Caliber Training Ammunition (RRTA) program is a critical technology development in response to the 7.62mm and .50 Caliber Capabilities Development Documents (CDD). The overall objective of the RRTA program is to develop and field 7.62mm RRTA cartridges that will provide a ballistic match to M80A1 and M62A1 cartridges to standard training ranges, while reducing the maximum range of the ammunition. This will allow soldiers to train with 7.62mm weapons on restricted ranges. The RRTA cartridge will be designed to be compatible with all Army 7.62mm weapons, but specifically optimized to work in the M240 Machine Gun. After the 7.62mm cartridge is matured. FY 2017 dollars support Technology Maturation and Risk Reduction in preparation for a TRL 6 demonstration and preparation for Milestone B.</p> <p>Project EL8: The Lightweight Small Caliber Ammunition (LSCA) program is a critical technology development in response to the 7.62mm and .50 Caliber Capabilities Development Documents (CDD). The goal of the LSCA Program is to reduce the Soldier load through reduction in ammunition weight. The LSCA Program will develop and field 7.62mm LSCA cartridges that will provide the same capabilities as the M80A1 and M62A1 cartridges. The LSCA cartridge will be designed to be compatible with all Army 7.62mm weapon systems, but specifically optimized to work in the M240 Machine Gun. After the 7.62mm cartridge is matured a .50 Caliber variant will be developed. FY 2017 funding will support 7.62mm TRL 6 evaluation of the 7.62mm Phase II Defense Ordinance Technology Consortium (DOTC) efforts, solicitation release, preliminary design review, and milestone B preparation for the LSCA Program.</p> <p>Project EU1: The Enhanced Lethality Cannon Munitions program will identify, develop, prototype, and demonstrate new enhanced lethality technologies, components, and subsystems maturity for Cannon munitions to enable fact-based analysis of enhanced lethality alternatives, quantify their effectiveness in mitigating evolving and derived capability gaps, reduce integration risk, and support transition into existing/new Cannon munitions. This program will evaluate and analyze the effectiveness, efficiency, producibility, affordability, safety, and compatibility of these prototype potential materiel solutions in high fidelity simulations and representative realistic performance-related developmental tests.</p> <p>Project EU2: The Improved Multi-Option Fuze will identify, develop, prototype, and demonstrate new improved multi-option fuze technologies, components, and subsystems based on Next Generation Proximity Sensor (NGPS) capabilities with built-in exportability attributes previously matured via OSD-sponsored Science and Technology efforts under the Joint Fuze Technology Program and Defense Exportability Features (DEF) Congressional Pilot Program. This program will evaluate and analyze the effectiveness, efficiency, producibility, affordability, safety, and compatibility of these prototype potential materiel solutions in representative realistic performance-related developmental tests.</p> <p>Project FA5: The objective of this advanced component development and prototyping effort is to identify, evaluate, mature, test, and demonstrate various assured precision prototype technologies in weapons and munitions systems to prove component and subsystem maturity in a system-of-systems environment and to reduce subsequent Program of Record (PoR) integration risk. Assured Precision Weapons and Munitions are an integral part of US military strategy and continue to enable combat overmatch and dominance across the Land Component battlespace. Unhindered access to trusted Positioning, Navigation, and Timing (PNT) information under conditions where existing space based PNT (i.e. P(Y)-Code Global Positioning System (GPS)) may be limited or denied has created the need to develop, prototype, and evaluate new/emerging Assured PNT capabilities (including M-Code GPS and Pseudolites) into both PGMs and Weapons operating in a complex system-of-systems environment. This imperative is reinforced by Public Law 111-383 Section 913 which mandates the use of Air Force-developed M-Code GPS capabilities in all systems fielded FY 2018 and beyond unless a waiver is obtained from the Secretary of Defense. As such, both precision weapon and munition PoRs must coordinate with the</p>		

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<b>Appropriation/Budget Activity</b> 2040: <i>Research, Development, Test &amp; Evaluation, Army / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>
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development and technology delivery activities of the Air Force's Military GPS User Equipment (MGUE) program as well as the Army's Assured PNT program to protect and insure critical precision-based Joint warfighting capabilities as well as maximizing effectiveness and efficiency of US taxpayer investments across multiple Lethality portfolios.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Previous President's Budget	29.318	46.749	42.240	-	42.240
Current President's Budget	24.402	46.749	40.096	-	40.096
Total Adjustments	-4.916	0.000	-2.144	-	-2.144
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-4.916	-	-2.144	-	-2.144

**Change Summary Explanation**

In FY 2017, PE 0603639A projects 694, EU1, EU2, and FA5 are new start programs.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition				<b>Project (Number/Name)</b> 656 / 120mm Cartridge (Advanced Multipurpose-AMP)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
656: 120mm Cartridge (Advanced Multipurpose-AMP)	-	14.179	27.578	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	41.757
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

In FY 2017 the program will transition to 0604802A ED7, 120mm Advanced Multipurpose (AMP) Cartridge. The 0604802A ED7, 120mm Advanced Multipurpose (AMP) Cartridge, program is not a new start. Funds in the 0604802A ED7, 120mm Advanced Multipurpose (AMP) Cartridge, program in FY 2017 are a realignment of funds from program 0603639A 656, 120mm Cartridge (Advanced Multipurpose-AMP), for more efficient, effective program management.

**A. Mission Description and Budget Item Justification**

The Advanced Multi Purpose (AMP) program is a direct fire line of sight 120mm large caliber munition under development for the Abrams Main Battle Tank. It has three modes of operation including point detonate, point detonate delay and airburst. AMP is the material solution for breaching double reinforced concrete walls and defeating Anti Tank Guided Missile (ATGM) teams from 50m to 2000m (T) and 50m to 4500m (O), a validated gap that cannot currently be met with existing stockpiled ammunition. In addition to added capability, AMP will also consolidate the capabilities of four existing stockpiled 120mm munitions, thereby addressing the users' battlecarry dilemma by allowing them to load a single munition that is capable of defeating multiple targets including ATGM teams, reinforced walls, personnel, light armor, bunkers, and obstacles. The full performance of the AMP is obtained with an Abrams equipped Ammunition Data Link breach modification, the same required by the 120mm M829E4 cartridge that achieved Milestone C in FY 2014. FY 2016 supports multiple contracts with competing prototypes in Phase 1 of 2 for Engineering and Manufacturing Development (EMD).

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<b>Title:</b> Phase I Engineering and Manufacturing Development (EMD)	14.179	27.578	-
<b>Description:</b> Funding is provided for the following effort.			
<b>FY 2015 Accomplishments:</b> Initiated EMD Phase 1 with two contract awards for competing prototypes. Contractors conducted engineering efforts focused on demonstrating cartridge performance requirements. This required hardware design and procurement along with initial component and cartridge level testing.			
<b>FY 2016 Plans:</b> Continue EMD Phase 1 with competing prototypes. Preliminary Design Review occurs in 2Q FY 2016. Design, build and deliver prototype hardware for cartridge demonstration and initiate shoot off testing.			
<b>Accomplishments/Planned Programs Subtotals</b>	14.179	27.578	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army	<b>Date:</b> February 2016
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<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> 656 / 120mm Cartridge (Advanced Multipurpose-AMP)
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**C. Other Program Funding Summary (\$ in Millions)**

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• AMP (PE / Project: 0604802A / ED7): 120mm Cartridge (Advanced Multipurpose-AMP)	-	-	31.215	-	31.215	31.655	28.018	-	-	0	90.888
• AMP (SSN: E88105): 120mm Cartridge (Advanced Multipurpose-AMP)	-	-	-	-	-	-	25.000	36.000	41.950	0.000	102.950

**Remarks**

**D. Acquisition Strategy**

The Advanced Multi Purpose Program (AMP) achieved Milestone B and entered Engineering and Manufacturing Development (EMD) in FY 2015. EMD consists of two phases; Phase 1 awarded two contracts to competitively prototype in FY 2015. A cartridge demonstration test will be conducted and used to support downselect to a single contractor for EMD Phase 2, followed by two Low Rate Initial Productions in FY 2019 and FY 2020 and one optional year of procurement in FY 2021.

**E. Performance Metrics**

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition				656 / 120mm Cartridge (Advanced Multipurpose-AMP)							
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Alliant Techsystems Operations LLC (ATK)	C/CPFF	Plymouth : Mn	0.000	5.345		10.900		-		-		-	Continuing	Continuing	Continuing
General Dynamics Ordnance and Tactical Systems, Inc (GDOTS)	C/CPFF	Saint Petersburg : Fl	0.000	5.345		10.900		-		-		-	Continuing	Continuing	Continuing
Program Manager Maneuver Ammunition Systems (PM-MAS) Labor and Travel	MIPR	Picatinny : NJ	0.009	0.422		0.998		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.009	11.112		22.798		-		-		-	-	-	-
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Army Research, Development and Engineering Center (ARDEC)	MIPR	Picatinny Arsenal : NJ	0.000	1.817		1.611		-		-		-	Continuing	Continuing	Continuing
Army Research Lab	MIPR	ARL Aberdeen : MD	0.000	-		0.700		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	1.817		2.311		-		-		-	-	-	-
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Yuma Test Center	MIPR	Yuma Proving Ground : AZ	0.000	0.750		0.750		-		-		-	Continuing	Continuing	Continuing
Aberdeen Test Center (ATC)	MIPR	Aberdeen Proving Ground : MD	0.000	0.500		1.719		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	1.250		2.469		-		-		-	-	-	-

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2017 Army</b>								<b>Date:</b> February 2016					
<b>Appropriation/Budget Activity</b> 2040 / 4				<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>				<b>Project (Number/Name)</b> 656 / <i>120mm Cartridge (Advanced Multipurpose-AMP)</i>					
	<b>Prior Years</b>	<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	0.009	14.179		27.578		-		-		-	-	-	-

**Remarks**

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> 656 / 120mm Cartridge (Advanced Multipurpose-AMP)
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(1) Milestone B	▲1				▲2				▲3				▲4				▲5				▲6				▲7			
(2) EMD Contract Phase I Awards																												
Engineering and Manufacturing Development (EMD) Phase I	EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I							
(3) Preliminary Design Review (PDR)	EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I			
(4) EMD Contract Phase II Award/Down-Select																												
Engineering and Manufacturing Development (EMD) Phase II	EMD Phase II				EMD Phase II				EMD Phase II				EMD Phase II				EMD Phase II				EMD Phase II							
(5) Critical Design Review	EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I			
Developmental Test & Evaluation (DT&E)																												
(6) Milestone C	EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I			
Low Rate Initial Production 1																												
Live Fire Test and Evaluation	EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I			
Independent Operational Test and Evaluation																												
Low Rate Initial Production 2	EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I				EMD Phase I			

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> 656 / <i>120mm Cartridge (Advanced Multipurpose-AMP)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Milestone B	1	2015	1	2015
EMD Contract Phase I Awards	4	2015	4	2015
Engineering and Manufacturing Development (EMD) Phase I	4	2015	1	2017
Preliminary Design Review (PDR)	3	2016	3	2016
EMD Contract Phase II Award/Down-Select	2	2017	2	2017
Engineering and Manufacturing Development (EMD) Phase II	2	2017	3	2019
Critical Design Review	3	2018	3	2018
Developmental Test & Evaluation (DT&E)	1	2019	3	2019
Milestone C	4	2019	4	2019
Low Rate Initial Production 1	4	2019	4	2020
Live Fire Test and Evaluation	2	2020	2	2020
Independent Operational Test and Evaluation	2	2020	2	2020
Low Rate Initial Production 2	4	2020	3	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition			<b>Project (Number/Name)</b> 694 / Medium Caliber Ammunition				
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
694: Medium Caliber Ammunition	-	0.000	0.000	2.170	-	2.170	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

In FY 2017, the program will transition to 0604802A EW1, 40mm Increased Range Anti-Personnel Ammunition (IRAP). Funds in the 0604802A EW1 40mm IRAP program in FY 2017 are a realignment of funds from program 0603639A 694, Medium Caliber Ammunition, for more efficient, effective program management. In FY 2017, PE 0603639A 694, Medium Caliber Ammunition, 40mm Increased Range Anti-Personnel (IRAP), is a new start.

**A. Mission Description and Budget Item Justification**

The 40mm Low Velocity (LV) Increased Range Anti-Personnel (IRAP) tactical cartridge allows the warfighter to effectively engage multiple targets, at increased ranges using the 40mm M203 and M320 Grenade Launchers. The IRAP 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 at increased ranges with greater accuracy and lethality. When deployed against point and area targets, the cartridge inflicts incapacitating effects against personnel or achieve a mobility kill against unarmored vehicles at increased ranges beyond those offered by the current M433 High Explosive Dual Purpose (HEDP) cartridge. IRAP is a new capability identified as a Warfighter requirement in the Capability Development Document, 40mm, Low Velocity Family of Ammunition Annex A1, Increased Range Anti-Personnel Cartridge. The cartridge provides lethal effects against targets with improved accuracy and greater standoff ranges increasing Soldier Survivability. FY 2017 supports Milestone B approval, Request for Proposal (RFP) preparation, Source Selection Planning, Government Technical Development and Cooperative Research and Development Agreement (CRADA) Testing. Engineering, Manufacturing Development will commence in FY 2017.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<b>Title:</b> Pre Engineering Manufacturing Development Activities	-	-	2.170
<b>Description:</b> After Milestone B approval but before the start of EMD, pre-award activities need to be accomplished.			
<b>FY 2017 Plans:</b> FY 2017 primary activities include Milestone B approval and Bid Sample Test competition. In preparation for contract award, Request for Proposal (RFP) preparation, release and review of proposals will occur along with source selection.			
<b>Accomplishments/Planned Programs Subtotals</b>	-	-	2.170

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> 694 / <i>Medium Caliber Ammunition</i>

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

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2017</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u>	<u>Total Cost</u>
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	
• 0604802A EW1: 40mm <i>Increased Range Anti-Personnel Ammunition (IRAP) 0604802A EW1</i>	-	-	0.353	-	0.353	5.308	9.732	9.023	7.205	0	31.621

**Remarks**

**D. Acquisition Strategy**

The IRAP cartridge will be developed through a competitive Engineering and Manufacturing Development (EMD) program. As part of the pre-EMD activities, Government Technical Development Testing and Cooperative Research and Development Agreement (CRADA) Testing with contractors will occur to evaluate potential designs. Within funding constraints, one or more Cost Plus contracts will be awarded for EMD. The Government plans to downselect to one contractor for LRIP and full rate production.

**E. Performance Metrics**

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition				694 / Medium Caliber Ammunition								
<b>Product Development (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Contractor 1 Low Velocity	C/CPFF	TBD : TBD	0.000	-		-		0.300		-		0.300	Continuing	Continuing	Continuing	
Contractor 2 Low Velocity	C/CPFF	TBD : TBD	0.000	-		-		0.300		-		0.300	Continuing	Continuing	Continuing	
<b>Subtotal</b>			0.000	-		-		0.600		-		0.600	-	-	-	
<b>Support (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Armament Research Development and Engineering Center (ARDEC)	MIPR	Picatinny Arsenal : NJ	0.000	-		-		0.570		-		0.570	Continuing	Continuing	Continuing	
<b>Subtotal</b>			0.000	-		-		0.570		-		0.570	-	-	-	
<b>Test and Evaluation (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Aberdeen Test Center (ATC)	MIPR	ATC : Aberdeen, MD	0.000	-		-		0.500		-		0.500	Continuing	Continuing	Continuing	
Yuma Proving Grounds (YPG)	MIPR	YPG : Yuma, AZ	0.000	-		-		0.500		-		0.500	Continuing	Continuing	Continuing	
<b>Subtotal</b>			0.000	-		-		1.000		-		1.000	-	-	-	
<b>Project Cost Totals</b>			0.000	-		0.000		2.170		-		2.170	-	-	-	
<b>Remarks</b>																

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> 694 / Medium Caliber Ammunition
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Tech Demo/CRADA Testing					Testing																											
(1) Milestone B (IRAP)													MS-E																			
(2) Engineering Manufacturing Development Contract Award(s)													EMD Contract Award																			
Engineering Manufacturing Development																																
(3) Test Readiness Review DET I (IRAP)																					TRR DET											
Development Engineering Test Phase I																					DET 1											
(4) Test Readiness Review DET II (IRAP)																					TRR DET 2											
Development Engineering Test Phase II																					DET 2											
(5) Test Readiness Review DT&E (IRAP)																									TRR DT&E							
Developmental Test & Evaluation																																
(6) MS-C (IRAP)																									MS-C							
Production Contract (IRAP)																																

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> 694 / <i>Medium Caliber Ammunition</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Tech Demo/CRADA Testing	1	2017	2	2017
Milestone B (IRAP)	4	2017	4	2017
Engineering Manufacturing Development Contract Award(s)	2	2018	2	2018
Engineering Manufacturing Development	3	2018	3	2021
Test Readiness Review DET I (IRAP)	2	2019	2	2019
Development Engineering Test Phase I	2	2019	2	2019
Test Readiness Review DET II (IRAP)	1	2020	1	2020
Development Engineering Test Phase II	2	2020	2	2020
Test Readiness Review DT&E (IRAP)	1	2021	1	2021
Developmental Test & Evaluation	1	2021	2	2021
MS-C (IRAP)	3	2021	3	2021
Production Contract (IRAP)	4	2021	4	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition				<b>Project (Number/Name)</b> EB8 / OWL for Small Caliber Ammunition			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
EB8: OWL for Small Caliber Ammunition	-	2.391	2.500	2.166	-	2.166	4.400	4.400	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

One Way Luminescence (OWL) develops a new tracer technology and applies it to multiple calibers. The initial focus was on 7.62mm ammunition in FY 2015 followed by 5.56mm in FY 2018 and .50 Caliber ammunition in FY 2019. As the technology matures it will be transitioned to Project 0654802A EP4 starting in FY 2018 for 7.62mm, and FY 2020 for 5.56mm and .50 Caliber. The OWL cartridge will be compatible with all Army Small Caliber weapon systems, but optimized for Machine Guns and will provide improved lethality/Target effects over the current tracer munition.

**A. Mission Description and Budget Item Justification**

The One Way Luminescence (OWL) program is a critical technology development in response to the 7.62mm, 5.56mm, and .50 Caliber Family of Ammunition Capabilities Development Documents (CDD). Current small caliber ammunition tracer rounds are a pyrotechnic tracer mix allowing enemy forces to see the trace round and track its trajectory back to the shooter. The OWL program objective develops and fields a full day/night 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. 7.62mm is the immediate focus followed by 5.56mm and .50 caliber OWL cartridges. FY 2017 funding supports maturation and downselect of the 7.62mm OWL technology, procurement of bullet components, "tracer" material and testing evaluation in order to attain a Technology Readiness Level (TRL) of 6. FY 2017 funding further supports EMD contract development necessary for a FY 2018 Milestone B.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<b>Title:</b> Technology Maturation and Risk Reduction (TMRR)	2.391	2.500	2.166
<b>Description:</b> One Way Luminescence (OWL) will develop and demonstrate a full day/night tracer technology that eliminates the shortcomings of current legacy tracers.			
<b>FY 2015 Accomplishments:</b> FY 2015 work included both Government and Contractor efforts to improve multiple 7.62mm prototype designs. Government and Contractor teams successfully demonstrated a Technology Readiness Level of 4. Government demonstrated trace visibility in a live fire event with full day/dusk and night conditions. The Government team conducted a static demonstration to 800 meters. Contractor effort's included a successful demonstration in a dynamic environment trace visibility in dusk and night conditions to a distance of 800 meters.			
<b>FY 2016 Plans:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army	<b>Date:</b> February 2016
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<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EB8 / <i>OWL for Small Caliber Ammunition</i>
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
FY 2016 continues with concurrent Government and Contractor efforts to mature technology readiness level in 7.62mm. The efforts include development, procurement, and testing of multiple competing prototype solutions to reduce risk in meeting user requirements. TRL 5 is demonstrated.			
<b>FY 2017 Plans:</b> FY 2017 efforts will include prototype downselect to a final technology for 7.62mm in preparation for MS-B. EMD Full and Open Contract development will occur in preparation for FY 2018 contact award. TRL 6 will be demonstrated.			
<b>Accomplishments/Planned Programs Subtotals</b>	2.391	2.500	2.166

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• PE 0604802A Project EP4: <i>OWL for Small Caliber Ammunition</i>	-	-	-	-	-	3.200	2.900	8.600	11.500	0	26.200

**Remarks**  
The 0604802A EP4, OWL for Small Caliber Ammunition program will not be a new start. FY 2018 funds are realigned from program 0603639A EB8, OWL for Small Caliber Ammunition, for more efficient and effective program management. The 0604802A EP4 OWL funding line continues the development work of 7.62mm, 5.56mm, and .50 Caliber OWL cartridges into Engineering and Manufacturing Development (EMD).

**D. Acquisition Strategy**  
The OWL concept will be developed through Government and Industry prototyping efforts. An annual Technology Readiness Assessment (TRA) was conducted in FY 2015 and will be conducted in FY 2016 and FY 2017 to measure the progress of the designs. In FY 2017, there will be a downselect between the industry and Government concepts in order to proceed with Engineering and Manufacturing Development (EMD). The Government will demonstrate TRL 6 for 7.62mm in FY 2017 to prepare for Milestone B. The 5.56mm and .50 Caliber cartridges will follow the 7.62mm schedule with Engineering and Manufacturing Development (EMD) starting at the end of FY 2020. These new tracer cartridges will replace legacy tracers in each of the various small caliber configurations.

**E. Performance Metrics**  
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition				EB8 / OWL for Small Caliber Ammunition							
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 Manager Maneuver Ammunition Systems (PM MAS) - Labor & Travel	MIPR	Picatinny Arsenal : New Jersey	0.000	0.200		0.200		0.150		-		0.150	Continuing	Continuing	Continuing
Physical Optics Corporation	C/FFP	Torrance : California	0.000	0.500		0.500		-		-		-	0	1.000	0
Battelle	C/FFP	Columbus : Ohio	0.000	0.500		0.500		-		-		-	0	1.000	0
<b>Subtotal</b>			0.000	1.200		1.200		0.150		-		0.150	-	-	-
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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			
Armament Research Development and Engineering Center (ARDEC)	MIPR	Picatinny Arsenal : New Jersey	0.000	0.791		0.900		1.391		-		1.391	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	0.791		0.900		1.391		-		1.391	-	-	-
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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			
Army Research Lab (ARL)	MIPR	Aberdeen : Maryland	0.000	0.200		0.200		0.200		-		0.200	Continuing	Continuing	Continuing
Army Corps of Engineers	MIPR	Fort Belvoir : Virginia	0.000	0.200		0.200		0.275		-		0.275	Continuing	Continuing	Continuing
Night Vision Labs (NVL)	MIPR	Fort Belvoir : Virginia	0.000	-		-		0.050		-		0.050	Continuing	Continuing	Continuing
Army Test Center (ATC)	MIPR	Aberdeen Proving Grounds : Maryland	0.000	-		-		0.100		-		0.100	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	0.400		0.400		0.625		-		0.625	-	-	-

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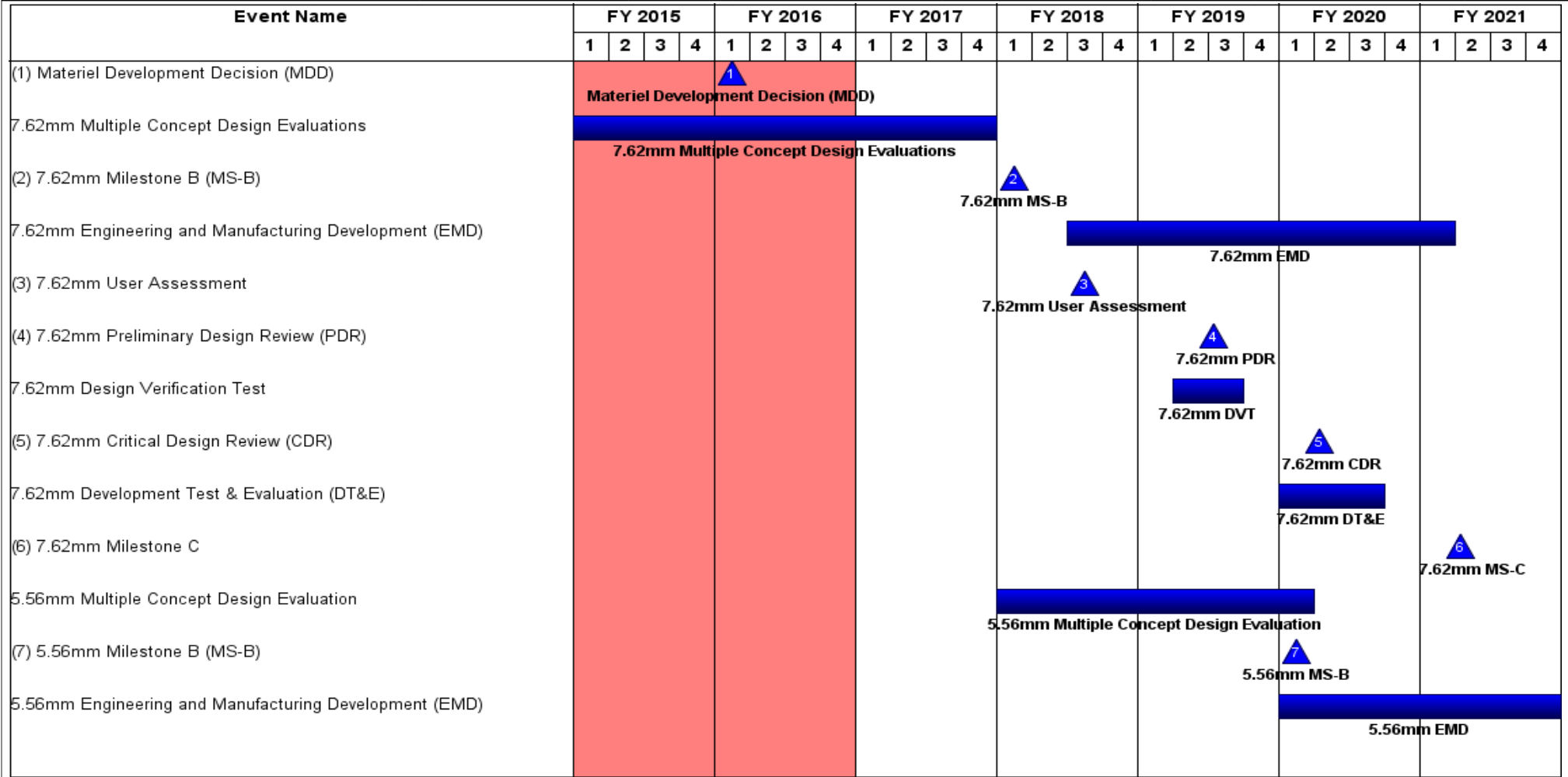
<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2017 Army</b>								<b>Date:</b> February 2016					
<b>Appropriation/Budget Activity</b> 2040 / 4				<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>				<b>Project (Number/Name)</b> EB8 / <i>OWL for Small Caliber Ammunition</i>					
	<b>Prior Years</b>	<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	0.000	2.391		2.500		2.166		-		2.166	-	-	-

**Remarks**

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EB8 / OWL for Small Caliber Ammunition
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**Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EB8 / OWL for Small Caliber Ammunition
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
5.56mm Design Verification Test																	5.56mm DVT															
(1) 5.56mm User Assessment																													▲ 1 5.56mm Caliber User Assessment			
(2) 5.56mm Preliminary Design Review (PDR)																													▲ 2 5.56mm PDR			
(3) 5.56mm Critical Design Review (CDR)																													▲ 3 5.56mm CDR			
(4) 5.56mm Development Test & Evaluation (DT&E)																	▲ 4 5.56mm DT&E															
.50 Caliber Multiple Concept Design Evaluation																	.50 Caliber Multiple Concept Design Evaluation															
(5) .50 Caliber Milestone B (MS-B)																													▲ 5 .50 Caliber MS-B			
.50 Caliber Engineering and Manufacturing Development (EMD)																	.50 Caliber EMD															
.50 Caliber Design Verification Test																													▲ 6 .50 Caliber DVT			
(6) .50 Caliber Preliminary Design Review (PDR)													▲ 7 .50 Caliber PDR																			
(7) .50 Caliber User Assessment													▲ 8 .50 Caliber User Assessment																			
(8) .50 Caliber Critical Design Review (CDR)													▲ 9 .50 Caliber CDR																			
.50 Caliber Development Test & Evaluation (DT&E)																	▲ 10 .50 Caliber DT&E															

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EB8 / <i>OWL for Small Caliber Ammunition</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Material Development Decision (MDD)	1	2016	1	2016
7.62mm Multiple Concept Design Evaluations	1	2015	4	2017
7.62mm Milestone B (MS-B)	1	2018	1	2018
7.62mm Engineering and Manufacturing Development (EMD)	3	2018	1	2021
7.62mm User Assessment	3	2018	3	2018
7.62mm Preliminary Design Review (PDR)	3	2019	3	2019
7.62mm Design Verification Test	2	2019	3	2019
7.62mm Critical Design Review (CDR)	2	2020	2	2020
7.62mm Development Test & Evaluation (DT&E)	1	2020	3	2020
7.62mm Milestone C	2	2021	2	2021
5.56mm Multiple Concept Design Evaluation	1	2018	1	2020
5.56mm Milestone B (MS-B)	1	2020	1	2020
5.56mm Engineering and Manufacturing Development (EMD)	1	2020	4	2021
5.56mm Design Verification Test	2	2020	3	2020
5.56mm User Assessment	3	2020	3	2020
5.56mm Preliminary Design Review (PDR)	4	2020	4	2020
5.56mm Critical Design Review (CDR)	3	2021	3	2021
5.56mm Development Test & Evaluation (DT&E)	4	2021	4	2021
.50 Caliber Multiple Concept Design Evaluation	1	2019	4	2019
.50 Caliber Milestone B (MS-B)	1	2020	1	2020
.50 Caliber Engineering and Manufacturing Development (EMD)	1	2020	4	2022
.50 Caliber Design Verification Test	2	2020	3	2020

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EB8 / <i>OWL for Small Caliber Ammunition</i>

Events	Start		End	
	Quarter	Year	Quarter	Year
.50 Caliber Preliminary Design Review (PDR)	4	2020	4	2020
.50 Caliber User Assessment	3	2020	3	2020
.50 Caliber Critical Design Review (CDR)	3	2021	3	2021
.50 Caliber Development Test & Evaluation (DT&E)	4	2021	4	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition				<b>Project (Number/Name)</b> EB9 / Tunable Pyrotechnic Aircraft Countermeasure Flares			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
EB9: Tunable Pyrotechnic Aircraft Countermeasure Flares	-	0.850	3.000	2.368	-	2.368	0.000	0.000	0.000	0.000	0.000	6.218
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project is essential to support the advanced development activities and technology demonstrations of the Aviation Airborne Expendable Countermeasure (AAECM) components and prototype munition decoys necessary to address emerging threat deficiencies in Army aircraft protection and the safety of its aircrews against advanced Man-Portable Air Defense Systems (MANPADS) and shoulder launched Surface-to-Air Missiles (SAM) systems. These efforts will evaluate integrated technologies and countermeasure prototype systems in realistic operating test environments to help expedite technology transition from the laboratory to operational use to demonstrate component and subsystem maturity prior to integration into major and complex Army aircraft platforms. These expendable countermeasures systems are an essential part of survivability equipment for Army aircraft. Army RDT&E efforts are coordinated with the PEO Aviation and its platform PMs with PM Aircraft Survivability Equipment (ASE) to address emerging JUONS from theatre.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<b>Title:</b> Expendable Countermeasures to Guided Missile Threats	0.850	3.000	2.368
<b>Description:</b> This program will develop expendable countermeasure decoys which will protect Army aircraft from surface-to-air missiles.			
<b>FY 2015 Accomplishments:</b> Developed and prepared documentation for Materiel Development Decision (MDD) approval for the Cloud Countermeasure (CM) decoy. This decoys is designed to defeat specific threat types. Details of their operation is classified.			
<b>FY 2016 Plans:</b> Prepare documentation (scope of work, drawings) to support contract award for Technology Development (TD) phase. TD phase results will down select best candidates for Milestone B decision for Cloud countermeasure and radar guided threat countermeasure.			
<b>FY 2017 Plans:</b> Develop and prepare documentation for Materiel Development Decision (MDD) approval for the Radar Guided CM and Radar Frequency (RF) decoyed. This decoy is designed to defeat specific threat types. Details of their operation is classified. Conduct initial DT/OT testing on Cloud CM.			
<b>Accomplishments/Planned Programs Subtotals</b>	0.850	3.000	2.368

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army	<b>Date:</b> February 2016
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<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EB9 / <i>Tunable Pyrotechnic Aircraft Countermeasure Flares</i>
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**C. Other Program Funding Summary (\$ in Millions)**

<b>Line Item</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• 0604802A - Weapons and Munitions -: <i>EP7 - Tunable Pyrotechnic Aircraft Countermeasure Flares</i>	-	1.000	1.450	-	1.450	4.400	2.500	-	-	0.000	9.350

**Remarks**

**D. Acquisition Strategy**

The Acquisition strategy is for a family of countermeasure flares that will be developed in incremental phases as funding and requirements are approved. Initial countermeasure flare is the Cloud CM followed by new increments that will defeat threats outlined in the requirements documents developed by TRADOC. MDD approval is in 3QFY16

**E. Performance Metrics**

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) EB9 / Tunable Pyrotechnic Aircraft Countermeasure Flares							
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	PM Close Combat Systems : Picatinny Arsenal	0.000	0.243		0.193		0.168	Jan 2017	-		0.168	0	0.604	0
<b>Subtotal</b>			0.000	0.243		0.193		0.168		-		0.168	0.000	0.604	0.000
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Award	TBD	ACC : Picatinny Arsenal	0.000	-		1.300		-		-		-	0	1.300	0
<b>Subtotal</b>			0.000	-		1.300		-		-		-	0.000	1.300	0.000
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Support	MIPR	ARDEC : Picatinny Arsenal	0.000	0.607		0.817		0.800	Jan 2017	-		0.800	0	2.224	0
<b>Subtotal</b>			0.000	0.607		0.817		0.800		-		0.800	0.000	2.224	0.000
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	AED : Redstone Arsenal	0.000	-		0.690		1.400	Jan 2017	-		1.400	0	2.090	0
<b>Subtotal</b>			0.000	-		0.690		1.400		-		1.400	0.000	2.090	0.000

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2017 Army</b>								<b>Date:</b> February 2016					
<b>Appropriation/Budget Activity</b> 2040 / 4				<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>				<b>Project (Number/Name)</b> EB9 / <i>Tunable Pyrotechnic Aircraft Countermeasure Flares</i>					
	<b>Prior Years</b>	<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	0.000	0.850		3.000		2.368		-		2.368	0.000	6.218	0.000

**Remarks**

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EB9 / Tunable Pyrotechnic Aircraft Countermeasure Flares
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Material Development Documentation and Decision for Cloud CM	██████████				██████████																							
Contract preparation Cloud CM	██████████				██████████																							
(1) Contract Award	██████████				██████████																							
Cloud CM prototyping and developmental testing	██████████				██████████																							
(2) Milestone A Radar Guided threat CM	██████████				██████████																							
Contract Preparation for Radar Guided CM	██████████				██████████																							
(3) Contract Award Radar Guided CM	██████████				██████████																							
Radar Guided CM Prototyping and Developmental Testing	██████████				██████████																							
(4) Milestone B Cloud CM	██████████				██████████																							
(5) Milestone B Radar Guided Threat CM	██████████				██████████																							

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EB9 / <i>Tunable Pyrotechnic Aircraft Countermeasure Flares</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Materiel Development Documentation and Decision for Cloud CM	2	2015	2	2016
Contract preparation Cloud CM	2	2016	3	2016
Contract Award	3	2016	3	2016
Cloud CM prototyping and developmental testing	3	2016	3	2017
Milestone A Radar Guided threat CM	1	2018	1	2018
Contract Preparation for Radar Guided CM	1	2018	4	2018
Contract Award Radar Guided CM	4	2018	4	2018
Radar Guided CM Prototyping and Developmental Testing	1	2019	3	2020
Milestone B Cloud CM	4	2017	4	2017
Milestone B Radar Guided Threat CM	1	2021	1	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition				<b>Project (Number/Name)</b> EC2 / Adv Armor-Piercing (ADVAP) for Small Cal Ammo			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
EC2: Adv Armor-Piercing (ADVAP) for Small Cal Ammo	-	5.280	7.700	0.000	-	0.000	3.800	6.900	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

In FY 2017 the 7.62mm ADVAP program will transition to 0604802A EP5, Advanced Armor-Piercing (ADVAP) for Small Cal Ammunition. The 0604802A EP5, Advanced Armor-Piercing (ADVAP) for Small Cal Ammunition, program is not a new start. Funds in the 0604802A EP5 ADVAP program in FY 2017 are a realignment of funds from program 0603639A EC2, Advanced Armor-Piercing (ADVAP) for Small Cal Ammunition, for more efficient and effective program management. The 0604802A EP5 ADVAP funding line continues the development work of both 7.62mm and 5.56mm ADVAP cartridges into Engineering and Manufacturing Development (EMD).

**A. Mission Description and Budget Item Justification**

The Advanced Armor-Piercing (ADVAP) program is a critical technology development in response to the 7.62mm and 5.56mm Family of Ammunition Capabilities Development Documents (CDD). The nomenclature for the 7.62mm ADVAP is now XM1158 and the companion trace is XM1159. The overall objective of the ADVAP program is to develop and Full Materiel Release (FMR) a 7.62mm XM1158 cartridge linked 4:1 with a trace cartridge (XM1159) followed by a 5.56mm cartridge variant that will provide overmatch capability to defeat advanced light armored threats within typical machine gun ranges. The 7.62mm XM1158 and XM1159 cartridge will be optimized for use in the M240 Machine Gun.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<b>Title:</b> Technology Maturation & Risk Reduction (TMRR)	5.280	7.700	-
<b>Description:</b> Develop, demonstrate, and qualify an XM1158 Small Caliber Ammo 7.62mm and 5.56mm ADVAP cartridges in order to defeat threat targets and provide overmatch capability versus a broad spectrum of hard targets.			
<b>FY 2015 Accomplishments:</b> FY 2015 work included optimization of the 7.62mm XM1158 projectile design through advanced modeling, simulation, and test iterations, along with alternate material studies, manufacturing studies and propellant requirement investigation.			
<b>FY 2016 Plans:</b> FY 2016 work includes optimization of the 7.62mm XM1158 cartridge design through advanced modeling, simulation, and test iterations, along with alternate material studies, manufacturing studies and propellant requirement investigation in order to demonstrate Technology Readiness Level (TRL) 6. Funding is also supporting preparation for MS-B.			
<b>Accomplishments/Planned Programs Subtotals</b>	5.280	7.700	-

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army	<b>Date:</b> February 2016
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<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EC2 / <i>Adv Armor-Piercing (ADVAP) for Small Cal Ammo</i>
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**C. Other Program Funding Summary (\$ in Millions)**

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• PE 0604802A Project EP5: <i>Advanced Armor-Piercing (ADVAP) for Small Cal Ammunition</i>	-	-	10.270	-	10.270	11.309	7.820	8.428	5.826	0.000	43.653

**Remarks**

This funding line continues the development work of both 7.62mm and 5.56mm ADVAP cartridges into EMD.

**D. Acquisition Strategy**

The 7.62mm and 5.56mm ADVAP programs will use a Government developed design and manufacturing processes. Multiple component contracts will be awarded to purchase raw materials and equipment. In FY 2016, design optimization and prototype manufacturing will occur in order to demonstrate TRL 6 for XM1158. Milestone B (MS-B) will occur in 1st QTR FY 2017 leading to fabrication and testing of qualification hardware. The 5.56mm cartridge will follow in FY 2018 under a similar strategy as 7.62mm.

**E. Performance Metrics**

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition				EC2 I Adv Armor-Piercing (ADVAP) for Small Cal Ammo							
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Manager Maneuver Ammunition Systems (PM MAS) Labor & Travel	MIPR	Picatinny Arsenal : New Jersey	0.000	0.200		0.200		-		-		-	Continuing	Continuing	Continuing
DoD Ordnance Technology Consortium (DOTC)	C/FFP	TBD : TBD	0.000	0.750		1.500		-		-		-	Continuing	Continuing	Continuing
Facilitization - TBD	C/FFP	TBD : TBD	0.000	0.250		0.750		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	1.200		2.450		-		-		-	-	-	-
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Armament Research Development and Engineering Center (ARDEC)	MIPR	Picatinny Arsenal : New Jersey	0.000	1.680		1.944		-		-		-	Continuing	Continuing	Continuing
Army Research Lab (ARL)	MIPR	Aberdeen : Maryland	0.000	1.000		1.478		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	2.680		3.422		-		-		-	-	-	-
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Army Research Lab (ARL)	MIPR	Aberdeen : Maryland	0.000	1.400		1.828		-		-		-	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	1.400		1.828		-		-		-	-	-	-
<b>Project Cost Totals</b>			0.000	5.280		7.700		-		-		-	-	-	-

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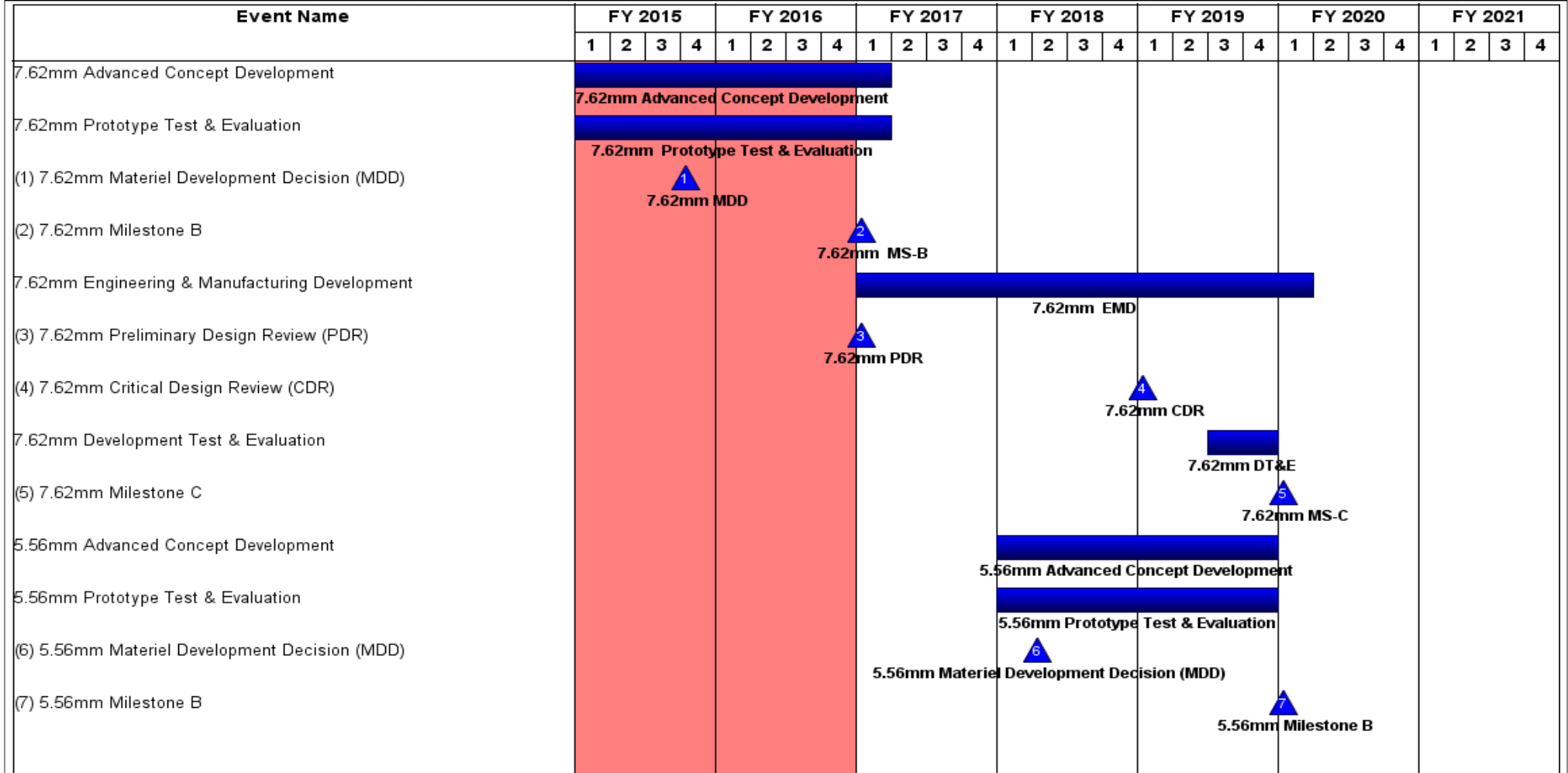
<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2017 Army							<b>Date:</b> February 2016			
<b>Appropriation/Budget Activity</b> 2040 / 4			<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>			<b>Project (Number/Name)</b> EC2 / <i>Adv Armor-Piercing (ADVAP) for Small Cal Ammo</i>				
	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>	

**Remarks**

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EC2 / Adv Armor-Piercing (ADVAP) for Small Cal Ammo
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**Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EC2 / Adv Armor-Piercing (ADVAP) for Small Cal Ammo
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
5.56mm Engineering & Manufacturing Development	5.56mm EMD																											
(1) 5.56mm Preliminary Design Review (PDR)																	▲ 5.56mm PDR											
(2) 5.56mm Critical Design Review (CDR)																									▲ 5.56mm			

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EC2 / <i>Adv Armor-Piercing (ADVAP) for Small Cal Ammo</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
7.62mm Advanced Concept Development	1	2015	1	2017
7.62mm Prototype Test & Evaluation	1	2015	1	2017
7.62mm Materiel Development Decision (MDD)	4	2015	4	2015
7.62mm Milestone B	1	2017	1	2017
7.62mm Engineering & Manufacturing Development	1	2017	1	2020
7.62mm Preliminary Design Review (PDR)	1	2017	1	2017
7.62mm Critical Design Review (CDR)	1	2019	1	2019
7.62mm Development Test & Evaluation	3	2019	4	2019
7.62mm Milestone C	1	2020	1	2020
5.56mm Advanced Concept Development	1	2018	4	2019
5.56mm Prototype Test & Evaluation	1	2018	4	2019
5.56mm Materiel Development Decision (MDD)	2	2018	2	2018
5.56mm Milestone B	1	2020	1	2020
5.56mm Engineering & Manufacturing Development	1	2020	4	2023
5.56mm Preliminary Design Review (PDR)	4	2019	4	2019
5.56mm Critical Design Review (CDR)	4	2021	4	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition			<b>Project (Number/Name)</b> EC3 / Ammunition Logistics Prototyping				
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
EC3: Ammunition Logistics Prototyping	-	1.702	3.571	2.017	-	2.017	2.258	2.825	2.478	1.826	0.000	16.677
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

In FY15 Project EC3 is a new start.

**A. Mission Description and Budget Item Justification**

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, 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.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<b>Title:</b> Munitions Health and Inventory Monitoring Systems	1.702	1.390	0.722
<b>Description:</b> Performance and reliability of certain munitions can be degraded by the environmental exposure history they have experienced in their lifetime. This program will develop simple to complex environmental health and inventory monitoring systems to improve reliability and asset visibility and enable effective Condition Based Management for Ammunition.			
<b>FY 2015 Accomplishments:</b> Modified passive time/temperature exposure sensor design to include user required additional temperature range and completed engineering tests.			
<b>FY 2016 Plans:</b> Complete operational testing and final design of a passive time/temperature exposure sensor. Design prototype components of an ammunition packaging mounted environmental health monitoring system that will facilitate improved ammunition management.			
<b>FY 2017 Plans:</b> Fabricate environmental health monitoring system prototypes and conduct engineering testing. Conduct correlation testing on the passive time/temperature exposure sensor with additional ammunition items.			
<b>Title:</b> Munitions Containerization Systems	-	0.596	0.812

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army		<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EC3 / <i>Ammunition Logistics Prototyping</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<p><b>Description:</b> For each family of munitions containers, optimize prototype container systems for automation compatibility, combat unit load quantity, sustainability/recyclability, Insensitive Munitions/explosives safety, environmental protection, load reconfiguration, unitization, and standardized interfaces. This will improve ammunition distribution efficiency while minimizing environmental and operational impacts.</p> <p><b>FY 2016 Plans:</b> Mature the design of an advanced lightweight plastic polymer cylindrical ammunition container.</p> <p><b>FY 2017 Plans:</b> Complete fabrication and prototype verification testing of the lightweight plastic polymer cylindrical ammunition container.</p>				
<p><b>Title:</b> Insensitive Munitions (IM) Integration</p> <p><b>Description:</b> Optimize multiple IM technologies to improve munitions survivability and warfighter safety. Advanced IM Technologies will be developed in the areas of warhead, propulsion and propellants, explosives, packaging, and barriers. Efforts will increase the number of IM compliant ammunition items fielded in order to mitigate munitions reaction to fast cook-off, slow cook-off, fragment impact, sympathetic reaction, bullet impact, and shaped charge jet.</p> <p><b>FY 2016 Plans:</b> Develop Insensitive Munitions (IM) booster explosives to replace booster materials in fuzes as well as supplemental and auxiliary charges. Develop less sensitive IM propellants for future mortar and tank munitions. Implement warhead venting technology for the 120mm high energy mortar round. Develop printable energetics for propellant charge designs.</p> <p><b>FY 2017 Plans:</b> Transition booster energetics to large caliber artillery and mortar programs. Integrate particle impact mitigating sleeves warhead venting features into large caliber warheads for impact and thermal threat mitigation. Implement container seam venting technologies into mortar packaging containers. Demonstrate improved shock response in printed propellant charge designs.</p>		-	1.585	0.483
<b>Accomplishments/Planned Programs Subtotals</b>		1.702	3.571	2.017
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b>				
N/A				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EC3 / <i>Ammunition Logistics Prototyping</i>

**E. Performance Metrics**

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition				EC3 / Ammunition Logistics Prototyping								
<b>Product Development (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Contractor-RRAPDS/Low Cost Thermal Indicator	MIPR	TBD : TBD	0.000	1.449		-		-		-		-	0	1.449	0	
Contract - RRAPDS	C/CPIF	TBD : TBD	0.000	-		1.400		0.550		-		0.550	0	1.950	0	
Contract-Plastic Cylindrical Container	MIPR	TBD : TBD	0.000	-		0.220		0.300		-		0.300	0	0.520	0	
Contract-Insensitive Munitions	MIPR	TBD : TBD	0.000	-		0.130		0.100		-		0.100	0	0.230	0	
<b>Subtotal</b>			0.000	1.449		1.750		0.950		-		0.950	0.000	4.149	0.000	
<b>Support (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
ARDEC	MIPR	Picatiny Arsenal : NJ	0.000	0.167		1.721		0.917		-		0.917	0	2.805	0	
<b>Subtotal</b>			0.000	0.167		1.721		0.917		-		0.917	0.000	2.805	0.000	
<b>Test and Evaluation (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Yuma Proving Ground	MIPR	Yuma : AZ	0.000	0.086		0.100		-		-		-	0	0.186	0	
Test and Eval	MIPR	TBD : TBD	0.000	-		-		0.150		-		0.150	0	0.150	0	
<b>Subtotal</b>			0.000	0.086		0.100		0.150		-		0.150	0.000	0.336	0.000	
<b>Project Cost Totals</b>			0.000	1.702		3.571		2.017		-		2.017	0.000	7.290	0.000	
<b>Remarks</b>																

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EC3 / Ammunition Logistics Prototyping
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Advanced Concept Development-Munitions Health Monitoring-1																												
Advanced Concept Development-Munitions Health Monitoring-1A																												
Advanced Concept Development-Munitions Health Monitoring-2																												
Advanced Concept Development-Munitions Containerization-1																												
Advanced Concept Development-Munitions Containerization-1A																												
Advanced Concept Development-Insensitive Munitions																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2017 Army</b>		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EC3 / <i>Ammunition Logistics Prototyping</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Advanced Concept Development-Munitions Health Monitoring-1	2	2015	4	2020
Advanced Concept Development-Munitions Health Monitoring-1A	1	2019	4	2021
Advanced Concept Development-Munitions Health Monitoring-2	2	2015	4	2021
Advanced Concept Development-Munitions Containerization-1	3	2016	4	2021
Advanced Concept Development-Munitions Containerization-1A	3	2017	4	2021
Advanced Concept Development-Insensitive Munitions	1	2016	4	2021

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EL6 / <i>Individual Assault Munition (IAM)</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
<i>EL6: Individual Assault Munition (IAM)</i>	-	0.000	0.000	0.000	-	0.000	1.896	8.469	10.980	0.000	0.000	21.345
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition			<b>Project (Number/Name)</b> EL7 / Reduced Range Small Caliber Training Ammunition				
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
EL7: Reduced Range Small Caliber Training Ammunition	-	0.000	0.000	2.166	-	2.166	9.000	13.500	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

This is a new start program in FY 2017. The 0603639A EL7, Reduced Range Small Caliber Training Ammunition (RRTA). The RRTA technology applies to multiple calibers. As the technology matures it will be transitioned to Project 0604802A EP3 starting in FY 2018 for 7.62mm, and FY 2020 for .50 caliber ammunition.

**A. Mission Description and Budget Item Justification**

The Reduced Range Small Caliber Training Ammunition (RRTA) program is a critical technology development in response to the 7.62mm and .50 Caliber Capabilities Development Documents (CDD). The overall objective of the RRTA program is to develop and field 7.62mm RRTA cartridges that will provide a ballistic match to M80A1 and M62A1 cartridges to standard training ranges, while reducing the maximum range of the ammunition. This will allow soldiers to train with 7.62mm weapons on restricted ranges. The RRTA cartridge will be designed to be compatible with all Army 7.62mm weapons, but specifically optimized to work in the M240 Machine Gun. After the 7.62mm cartridge is matured. FY 2017 dollars support Technology Maturation and Risk Reduction in preparation for a TRL 6 demonstration and preparation for Milestone B.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<b>Title:</b> Technology Maturation and Risk Reduction (TMRR)	-	-	2.166
<b>Description:</b> Develop, demonstrate, and quantify a Reduced Range Small Caliber Training Ammunition (RRTA) 7.62mm capability that will provide a reduced range training capability to the M240 gunner.			
<b>FY 2017 Plans:</b> Mature development and demonstrate (TRL6) 7.62mm Ball and Trace RRTA cartridges. Conduct Materiel Development Decision (MDD), Preliminary Design Review (PDR), and Milestone B (MS-B) preparations.			
<b>Accomplishments/Planned Programs Subtotals</b>	-	-	2.166

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

<b>Line Item</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• PE 0604802A Project EP3: Reduced Range Small Caliber Training Ammunition	-	-	-	-	-	6.000	5.000	20.900	10.500	0.000	42.400

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army	<b>Date:</b> February 2016
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<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EL7 / <i>Reduced Range Small Caliber Training Ammunition</i>
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**C. Other Program Funding Summary (\$ in Millions)**

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

The 0604802A EP3, Reduced Range Small Caliber Training Ammunition (RRTA), program will not be a new start. Funds in this program in FY 2018 are a realignment of funds from program 0603639A EL7, Reduced Range Small Caliber Training Ammunition, for more efficient, effective program management. The 0604802A EP3 RRTA funding line continues the development work of 7.62mm and .50 Caliber RRTA cartridges into Engineering and Manufacturing Development (EMD).

**D. Acquisition Strategy**

The government plans to award up to two contracts under the Defense Ordnance Technology Consortium (DOTC) for initial prototype evaluation in FY 2017. After Milestone B in FY 2018, the government intends to downselect to one contract to complete the development and transition into production. The .50 Caliber program will follow a similar strategies starting in FY 2018.

**E. Performance Metrics**

N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EL7 / Reduced Range Small Caliber Training Ammunition
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<b>Product Development (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Program Manager Maneuver Ammunition Systems (PM MAS) - Labor and Travel	Various	Picatinny Arsenal : New Jersey	0.000	-		-		0.066		-		0.066	Continuing	Continuing	Continuing
Contractor 1	TBD	TBD : TBD	0.000	-		-		0.650		-		0.650	Continuing	Continuing	Continuing
Contractor 2	TBD	TBD : TBD	0.000	-		-		0.650		-		0.650	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	-		-		1.366		-		1.366	-	-	-

**Remarks**

N/A

<b>Support (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Armament Research Development and Engineering Center (ARDEC)	MIPR	Picatinny Arsenal : New Jersey	0.000	-		-		0.450		-		0.450	Continuing	Continuing	Continuing
Army Research Lab (ARL)	MIPR	Aberdeen Proving Grounds : Maryland	0.000	-		-		0.100		-		0.100	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	-		-		0.550		-		0.550	-	-	-

**Remarks**

N/A

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Aberdeen Test Center (ATC)	MIPR	Aberdeen Proving Grounds : Maryland	0.000	-		-		0.250		-		0.250	Continuing	Continuing	Continuing

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EL7 / <i>Reduced Range Small Caliber Training Ammunition</i>
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Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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			
<b>Subtotal</b>			0.000	-		-		0.250		-		0.250	-	-	-

**Remarks**  
N/A

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	0.000	-	0.000	2.166	-	2.166	-	-	-

**Remarks**

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




<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EL7 / Reduced Range Small Caliber Training Ammunition
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021												
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4									
(1) 7.62mm Materiel Development Decision (MDD)	7.62mm Materiel Development Decision (MDD)								▲																												
7.62mm Prototype Contracts 1-2									7.62mm Prototype Contracts 1-2																												
7.62mm Prototype Test & Evaluation									7.62mm Prototype Test & Evaluation																												
(2) 7.62mm Milestone B (MS-B)													7.62mm MS-B				▲																				
7.62mm Engineering and Manufacturing Development (EMD)																	7.62mm EMD																				
7.62mm Developmental Test and Evaluation (DT&E)																	7.62mm DT&E																				
(3) 7.62mm Preliminary Design Review (PDR) Government																					7.62mm PDR Government				▲												
(4) 7.62mm Critical Design Review (CDR)																									7.62mm CDR				▲								
(5) .50 Caliber Materiel Development Decision (MDD)													.50 Caliber MDD				▲																				
.50 Caliber Prototype Contracts 1-2													.50 Caliber Prototype Contracts 1-2																								
(6) .50 Caliber Preliminary Design Review (PDR) Government																	.50 Caliber Preliminary Design Review (PDR) Government				▲																
(7) .50 Caliber Milestone B (MS-B)																					.50 Caliber (MS-B)				▲												
.50 Caliber Engineering and Manufacturing Development (EMD)																					.50 Caliber EMD																

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EL7 / Reduced Range Small Caliber Training Ammunition
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
(1) .50 Caliber Preliminary Design Review (PDR)																												
.50 Caliber Developmental Test and Evaluation (DT&E)																												
(2) .50 Caliber Critical Design Review (CDR)																												
																					 .50 PDR  .50 Caliber DT&E					 .50 CD		

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EL7 / <i>Reduced Range Small Caliber Training Ammunition</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
7.62mm Materiel Development Decision (MDD)	1	2017	1	2017
7.62mm Prototype Contracts 1-2	2	2017	4	2017
7.62mm Prototype Test & Evaluation	3	2017	2	2018
7.62mm Milestone B (MS-B)	1	2019	1	2019
7.62mm Engineering and Manufacturing Development (EMD)	1	2019	4	2020
7.62mm Developmental Test and Evaluation (DT&E)	2	2019	4	2019
7.62mm Preliminary Design Review (PDR) Government	1	2020	1	2020
7.62mm Critical Design Review (CDR)	2	2021	2	2021
.50 Caliber Materiel Development Decision (MDD)	1	2018	1	2018
.50 Caliber Prototype Contracts 1-2	2	2018	1	2019
.50 Caliber Preliminary Design Review (PDR) Government	1	2019	1	2019
.50 Caliber Milestone B (MS-B)	4	2019	4	2019
.50 Caliber Engineering and Manufacturing Development (EMD)	1	2020	4	2020
.50 Caliber Preliminary Design Review (PDR)	4	2020	4	2020
.50 Caliber Developmental Test and Evaluation (DT&E)	4	2020	1	2021
.50 Caliber Critical Design Review (CDR)	4	2021	4	2021

**Note**

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition				<b>Project (Number/Name)</b> EL8 / LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
EL8: LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER	-	0.000	2.400	1.280	-	1.280	2.500	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

Lightweight Small Caliber Ammunition will develop and qualify lightweight cartridge case for 7.62mm ammunition to replace current brass cartridge case. The initial focus will be on 7.62mm ammunition followed by .50 caliber variant in FY 2018. In FY 2017 the 7.62mm program will transition to 0604802A EP6, Lightweight Cartridge Case for Small Caliber Ammunition. The 0604802A EP6, Lightweight Cartridge Case for Small Caliber Ammunition, program is not a new start. Funds in the 0604802A EP6, Lightweight Cartridge Case for Small Caliber Ammunition, program in FY 2017 are a realignment of funds from program 0603639A EL8, Lightweight Cartridge Case for Small Caliber Ammunition, for more efficient and effective program management.

**A. Mission Description and Budget Item Justification**

The Lightweight Small Caliber Ammunition (LSCA) program is a critical technology development in response to the 7.62mm and .50 Caliber Capabilities Development Documents (CDD). The goal of the LSCA Program is to reduce the Soldier load through reduction in ammunition weight. The LSCA Program will develop and field 7.62mm LSCA cartridges that will provide the same capabilities as the M80A1 and M62A1 cartridges. The LSCA cartridge will be designed to be compatible with all Army 7.62mm weapon systems, but specifically optimized to work in the M240 Machine Gun. After the 7.62mm cartridge is matured a .50 Caliber variant will be developed. FY 2017 funding will support 7.62mm TRL 6 evaluation of the 7.62mm Phase II Defense Ordinance Technology Consortium (DOTC) efforts, solicitation release, preliminary design review, and milestone B preparation for the LSCA Program.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<b>Title:</b> 7.62mm Technology Maturation & Risk Reduction (TMRR) for Lightweight Small Caliber Ammunition (LSCA)	-	2.400	1.280
<b>Description:</b> Develop, demonstrate, and qualify a Lightweight Small Caliber Ammunition (LSCA) 7.62mm capability that will provide an ammunition weight savings of twenty percent to the M240 gunner, assistant gunner and ammo bearer.			
<b>FY 2016 Plans:</b> Complete the Phase I Defense Ordinance Technology Consortium (DOTC) efforts and demonstrate TRL 6 evaluation on 7.62mm M80 (legacy) polymeric cartridges Phase I DOTC efforts. Initiate two Phase II DOTC efforts to determine whether lightweight polymer case can maintain performance and reliability of the current specify 7.62mm M80A1 and M62A1 cartridges. Conduct Materiel Development Decision (MDD) and generate and compile required documentation for Full and Open Competition (i.e.			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army	<b>Date:</b> February 2016
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<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EL8 / <i>LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER</i>
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2015	FY 2016	FY 2017
Market Survey, Acquisition Plan/Acquisition Strategy, Source Selection Plan, Statement of Work, Performance Specification, Independent Cost Estimate, etc).			
<b><i>FY 2017 Plans:</i></b> Complete Phase II DOTC efforts and demonstrate TRL 6 for M80A1 and M62A1 LSCA cartridge deliverables will undergo TRL 6 evaluation. Finalize documentation required for Full and Open competition by including the information obtained from the Phase II DOTC efforts. Conduct a technology readiness assessment, develop the request for proposal, and obtain MS B approval.			
<b>Accomplishments/Planned Programs Subtotals</b>	-	2.400	1.280

<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• PE 0654802A Project EP6: <i>Lightweight Cartridge Case for Small Caliber Ammunition</i>	-	-	1.290	-	1.290	3.808	3.820	7.829	4.826	0.000	21.573

**Remarks**

**D. Acquisition Strategy**

During Technology Maturation and Risk Reduction (TMRR), award up to two contracts for initial prototype evaluation of the M80A1 and M62A1 LSCA in FY 2016 via Department of Defense (DOD) Ordnance Technology Consortium (DOTC) resulting in 7.62mm LSCA TRL 6 Demonstrations. During Engineering and Manufacturing Development (EMD), award a two-phased Full and Open Competitive contract upon Milestone B approval. The Government intends to award up to two contracts for Phase I and downselect to one contractor for Phase II to manufacture test hardware to support Production Qualification Testing planned for FY 2021. Milestone C is planned for FY 2022 and .50 caliber will follow a similar approach starting in FY 2018.

**E. Performance Metrics**

N/A

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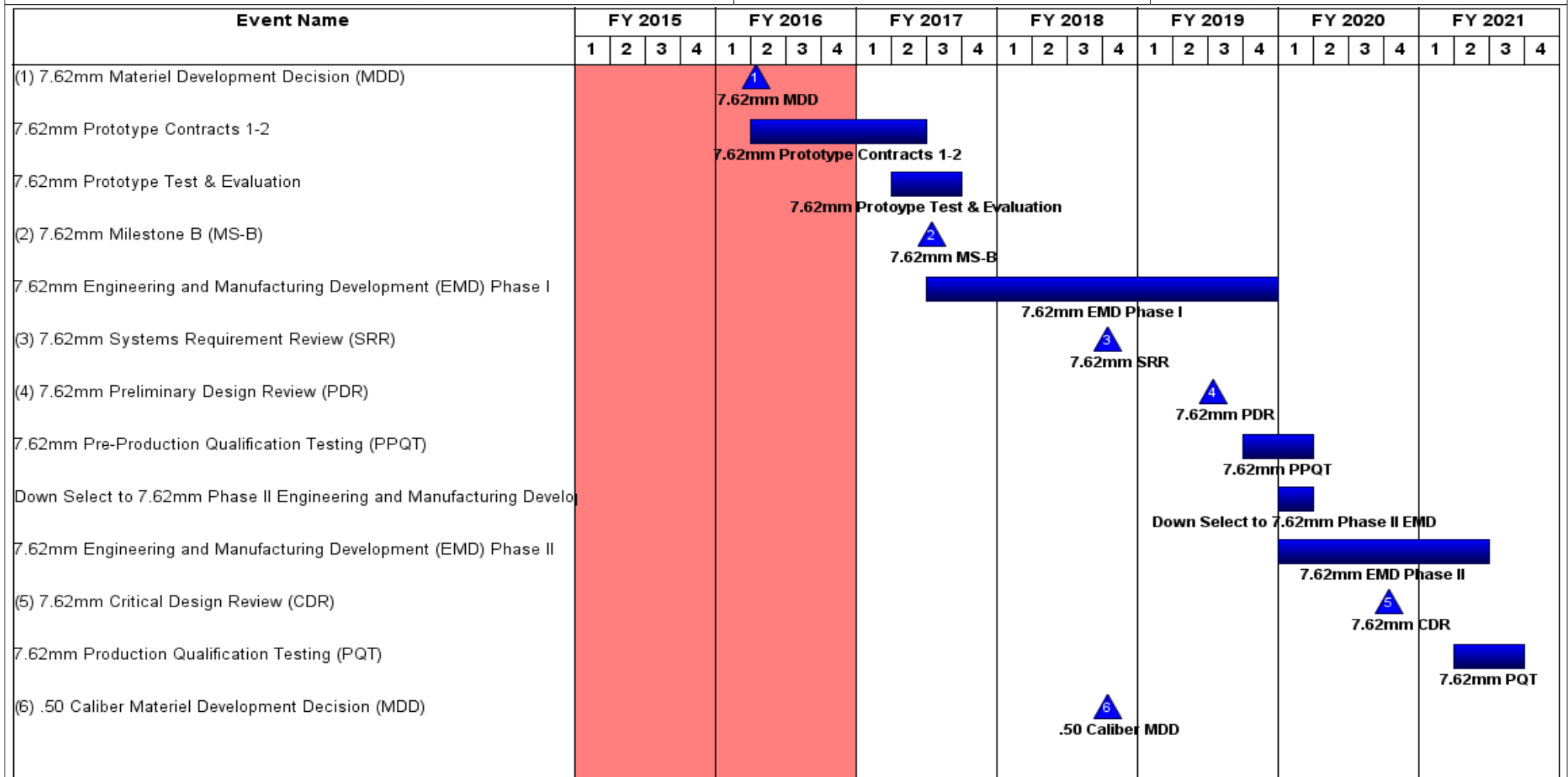
Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition				EL8 / LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER							
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 Manager Maneuver Ammunition Systems (PM MAS) - Labor and Travel	Various	Picatinny Arsenal : New Jersey	0.000	-		0.200		0.090		-		0.090	Continuing	Continuing	Continuing
Contract 1	TBD	TBD : TBD	0.000	-		0.750		0.075		-		0.075	Continuing	Continuing	Continuing
Contract 2	TBD	TBD : TBD	0.000	-		0.750		0.075		-		0.075	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	-		1.700		0.240		-		0.240	-	-	-
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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			
Armament Research Development and Engineering Center (ARDEC)	MIPR	Picatinny Arsenal : New Jersey	0.000	-		0.450		0.420		-		0.420	Continuing	Continuing	Continuing
Army Research Lab (ARL)	MIPR	Aberdeen Proving Grounds : Maryland	0.000	-		-		0.180		-		0.180	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	-		0.450		0.600		-		0.600	-	-	-
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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			
Aberdeen Test Center (ATC)	MIPR	Aberdeen Proving Grounds : Maryland	0.000	-		0.250		0.440		-		0.440	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	-		0.250		0.440		-		0.440	-	-	-
<b>Project Cost Totals</b>			0.000	-		2.400		1.280		-		1.280	-	-	-



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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EL8 / LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER
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**Exhibit R-4, RDT&E Schedule Profile: PB 2017 Army** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EL8 / LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
.50 Caliber Prototype Test & Evaluation																	.50 Caliber Prototype Test & Evaluation															
(1) .50 Caliber Milestone B (MS-B)																					▲ .50 Caliber MS-B											
.50 Caliber Engineering and Manufacturing Development (EMD)									.50 Caliber EMD																							
(2) .50 Caliber Preliminary Design Review (PDR)																													▲ .50 Caliber PDR			
(3) .50 Caliber Critical Design Review (CDR)	.50 Caliber CDR																															

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EL8 / <i>LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
7.62mm Materiel Development Decision (MDD)	2	2016	2	2016
7.62mm Prototype Contracts 1-2	2	2016	2	2017
7.62mm Prototype Test & Evaluation	2	2017	3	2017
7.62mm Milestone B (MS-B)	3	2017	3	2017
7.62mm Engineering and Manufacturing Development (EMD) Phase I	3	2017	4	2019
7.62mm Systems Requirement Review (SRR)	4	2018	4	2018
7.62mm Preliminary Design Review (PDR)	3	2019	3	2019
7.62mm Pre-Production Qualification Testing (PPQT)	4	2019	1	2020
Down Select to 7.62mm Phase II Engineering and Manufacturing Development (EMD)	1	2020	1	2020
7.62mm Engineering and Manufacturing Development (EMD) Phase II	1	2020	2	2021
7.62mm Critical Design Review (CDR)	4	2020	4	2020
7.62mm Production Qualification Testing (PQT)	2	2021	3	2021
.50 Caliber Materiel Development Decision (MDD)	4	2018	4	2018
.50 Caliber Prototype Test & Evaluation	1	2019	4	2019
.50 Caliber Milestone B (MS-B)	4	2019	4	2019
.50 Caliber Engineering and Manufacturing Development (EMD)	1	2020	4	2021
.50 Caliber Preliminary Design Review (PDR)	2	2020	2	2020
.50 Caliber Critical Design Review (CDR)	2	2021	2	2021

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition				<b>Project (Number/Name)</b> EU1 / Enhanced Lethality Cannon Munitions			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
EU1: <i>Enhanced Lethality Cannon Munitions</i>	-	0.000	0.000	9.866	-	9.866	10.000	0.000	0.000	0.000	0.000	19.866
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

Project EU1, Enhanced Lethality Cannon Munitions is a new start program in FY 2017.

**A. Mission Description and Budget Item Justification**

This program will identify, develop, prototype, and demonstrate new enhanced lethality technologies, components, and subsystems maturity for cannon munitions to enable fact-based analysis of enhanced lethality alternatives, quantify their effectiveness in mitigating evolving and derived capability gaps, reduce integration risk, and support transition into existing/new cannon munitions. This program will evaluate and analyze the effectiveness, efficiency, producibility, affordability, safety, and compatibility of these prototype potential materiel solutions in high fidelity simulations and representative realistic performance-related developmental tests. Up to four potential enhanced lethality cannon munition materiel solution alternatives from Government and Industry will be prototyped and evaluated. The best of these potential materiel alternatives will be further refined, tested, and demonstrated prior to the transition of mature enhanced lethality technologies into existing/new cannon munition Programs of Record (PoRs). This program addresses derived requirements for increased organic Brigade Combat Team (BCT) indirect fire stowed kills, potential lethality shortfalls of smaller payload extended range cannon munitions fired from existing fielded US weapon systems, and increased lethality demands being placed on unitary cannon artillery rounds due to the pending policy-driven loss of cluster munitions.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<b>Title:</b> FY 2017 Plans	-	-	9.866
<b>Description:</b> Identify, develop, and prototype enhanced lethality technologies.			
<b>FY 2017 Plans:</b> Identify, develop, and prototype potential enhanced lethality technologies, material processes, components, and subsystems in a 155mm Cannon artillery munition form factor. Conduct initial lethality simulations and performance-related developmental tests for up to four potential prototype alternatives to determine potential effectiveness, efficiency, producibility, affordability, safety, and compatibility with existing US weapon systems and propellants.			
<b>Accomplishments/Planned Programs Subtotals</b>	-	-	9.866

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army	<b>Date:</b> February 2016
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<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EU1 / <i>Enhanced Lethality Cannon Munitions</i>
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**C. Other Program Funding Summary (\$ in Millions)**

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• PE 604802 / EU7: <i>Enhanced Lethality Cannon Munitions (RDTE 6.5)</i>	-	-	-	-	-	-	8.000	8.000	8.000	0.000	24.000

**Remarks**

**D. Acquisition Strategy**

As a pre-Milestone B advanced component development and competitive prototyping program, this effort will identify, develop, prototype, evaluate, analyze, and demonstrate up to four potential enhanced lethality alternative solutions from Government and Industry. This effort will quantify their respective maturity and effectiveness in mitigating evolving and derived capability gaps across a representative range of enemy target sets and operational scenarios. Appropriate mature enhanced lethality technologies will be selected for subsequent transition as an inherent part of new cannon munition programs of record development at Milestone B, via Engineering and Manufacturing Development into ongoing cannon munition development programs, via material changes into existing production cannon munitions, and/or via Recapitalization of the “on-the-shelf” cannon munition war reserve stockpile.

**E. Performance Metrics**

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition				EU1 / Enhanced Lethality Cannon Munitions								
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	Cost To Complete			
Enhanced Lethality Development and Prototyping	MIPR	TBD/Various : Various	0.000	-		-		7.416	Jan 2017	-		7.416	7.500	14.916	14.916	
<b>Subtotal</b>			0.000	-		-		7.416		-		7.416	7.500	14.916	14.916	
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	Cost To Complete			
Program Management	MIPR	PM CAS : Picatinny, NJ	0.000	-		-		0.650	Jan 2017	-		0.650	0.650	1.300	1.300	
Government Engineering Support Costs	MIPR	ARDEC : Picatinny, NJ	0.000	-		-		-		-		-	0.550	0.550	0.550	
<b>Subtotal</b>			0.000	-		-		0.650		-		0.650	1.200	1.850	1.850	
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	Cost To Complete			
Performance-related Developmental tests	MIPR	Naval Surface Warfare Center : Dahlgren, VA	0.000	-		-		1.400	Feb 2017	-		1.400	0.200	1.600	1.600	
Performance-related developmental tests	MIPR	Yuma Proving Ground : Yuma, AZ	0.000	-		-		-		-		-	0.600	0.600	0.600	
Lethality Simulations and Evaluation	MIPR	ARDEC : Picatinny, NJ	0.000	-		-		0.400	Jan 2017	-		0.400	0.500	0.900	0.900	
<b>Subtotal</b>			0.000	-		-		1.800		-		1.800	1.300	3.100	3.100	
<b>Project Cost Totals</b>			0.000	-		0.000		9.866		-		9.866	10.000	19.866	19.866	

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2017 Army							<b>Date:</b> February 2016			
<b>Appropriation/Budget Activity</b> 2040 / 4			<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>			<b>Project (Number/Name)</b> EU1 / <i>Enhanced Lethality Cannon Munitions</i>				
	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>	

**Remarks**

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EU1 / <i>Enhanced Lethality Cannon Munitions</i>
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021															
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4												
Identify, Develop, and Prototype Candidate for Technology Solution																																								
Conduct Initial Performance-Related Developmental Tests																																								
Evaluate, Analyze, and Downselect Candidate for Prototype Solution																																								
Refine Best Candidate for Prototype Solution																																								
Conduct Final Performance-Related Developmental Tests																																								

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EU1 / <i>Enhanced Lethality Cannon Munitions</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Identify, Develop, and Prototype Candidate for Technology Solution	1	2017	4	2018
Conduct Initial Performance-Related Developmental Tests	2	2017	4	2017
Evaluate, Analyze, and Downselect Candidate for Prototype Solution	4	2017	1	2018
Refine Best Candidate for Prototype Solution	2	2018	3	2018
Conduct Final Performance-Related Developmental Tests	3	2018	4	2018

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

<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition				<b>Project (Number/Name)</b> EU2 / Improved Multi-Option Fuze (iMOFA/iMOFM)			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
EU2: Improved Multi-Option Fuze (iMOFA/iMOFM)	-	0.000	0.000	7.892	-	7.892	0.000	0.000	0.000	0.000	0.000	7.892
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**Note**

Project EU2, Improved Multi-Option Fuze is a new start program in FY 2017

**A. Mission Description and Budget Item Justification**

This program will identify, develop, prototype, and demonstrate new improved multi-option fuze technologies, components, and subsystems based on Next Generation Proximity Sensor (NGPS) capabilities with built-in exportability attributes previously matured via OSD-sponsored techbase efforts under the Joint Fuze Technology Program and Defense Exportability Features (DEF) Congressional Pilot Program. This program will evaluate and analyze the effectiveness, efficiency, producibility, affordability, safety, and compatibility of these prototype potential materiel solutions in representative realistic performance-related developmental tests. Up to four potential improved multi-option fuze solution alternatives from Government and/or Industry will be prototyped and evaluated leveraging NGPS with built-in DEF technology. This program will enable fact-based analysis of new height of burst/proximity fuzing alternatives that are resistant to enemy countermeasures and reverse engineering threats, quantify their effectiveness, reduce integration risk, and support transition into existing/new artillery/mortar fuzes and munitions.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<b>Title:</b> FY 2017 Plans	-	-	7.892
<b>Description:</b> Identify, develop, prototype, and assess improved multi-option fuze technologies.			
<b>FY 2017 Plans:</b> Identify, develop, and prototype potential improved multi-option fuze technologies, components, and subsystems using NGPS with built-in DEF. Conduct performance-related developmental tests for up to four potential prototype alternatives to quantify effectiveness, reduce risk, and support transition into improved Multi-Option Fuze Artillery (iMOFA) and improved Multi-Option Fuze Mortar (iMOFM) applications.			
<b>Accomplishments/Planned Programs Subtotals</b>	-	-	7.892

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

<b>Line Item</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• PE 604802/EU8: Improved Multi-Option Fuze (RDTE 6.5)	-	-	-	-	-	8.000	8.000	10.000	-	0.000	26.000

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EU2 / <i>Improved Multi-Option Fuze (iMOFA/iMOFM)</i>

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

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

**D. Acquisition Strategy**

As an advanced component development and competitive prototyping program, this effort will identify, develop, prototype, evaluate, analyze, and demonstrate up to four potential improved Multi-Option Fuze solutions from Government and Industry. This effort will quantify their respective maturity and effectiveness in providing conventional Cannon and Mortar munitions a height of burst/proximity fuzing capability that is resistant to enemy countermeasures and reverse engineering threats. Appropriate mature potential solutions will be selected for subsequent transition as an inherent part of new improved Multi-Option Fuze programs of record. Subsequent respective Engineering and Manufacturing Development efforts will be Type Classified Standard with supporting detailed government-owned Technical Data Packages (TDPs) to enable "build to print" by Industry.

**E. Performance Metrics**

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition				EU2 / Improved Multi-Option Fuze (iMOFA/iMOFM)							
Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Improved Multi-Option Fuze Development and Prototyping	MIPR	TBD : Various	0.000	-		-		5.892	Jan 2017	-		5.892	0	5.892	5.892
<b>Subtotal</b>			0.000	-		-		5.892		-		5.892	0.000	5.892	5.892
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	PM CAS : Picatinny, NJ	0.000	-		-		0.500	Jan 2017	-		0.500	0	0.500	0.500
<b>Subtotal</b>			0.000	-		-		0.500		-		0.500	0.000	0.500	0.500
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Improved Multi-Option Fuze Evaluation	MIPR	ARDEC : Picatinny, NJ	0.000	-		-		0.500	Jan 2017	-		0.500	0	0.500	0.500
Performance-related Developmental Test	MIPR	Yuma Proving Ground : Yuma, AZ	0.000	-		-		0.500	Apr 2017	-		0.500	0	0.500	0.500
Performance-related Developmental Test	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	0.000	-		-		0.500	Apr 2017	-		0.500	0	0.500	0.500
<b>Subtotal</b>			0.000	-		-		1.500		-		1.500	0.000	1.500	1.500
<b>Project Cost Totals</b>			0.000	-		0.000		7.892		-		7.892	0.000	7.892	7.892
<b>Remarks</b>															

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> EU2 / Improved Multi-Option Fuze (iMOFA/iMOFM)
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Identify, Develop, and Prototype Candidate for Technology Solution																												
Conduct Performance-Related Developmental Tests																												
Evaluate and Analyze Prototype Solutions and Transition Technology																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Army		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EU2 / <i>Improved Multi-Option Fuze (iMOFA/iMOFM)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Identify, Develop, and Prototype Candidate for Technology Solution	1	2017	3	2017
Conduct Performance-Related Developmental Tests	2	2017	4	2017
Evaluate and Analyze Prototype Solutions and Transition Technology	4	2017	1	2018

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> EU3 / <i>.50 Caliber All-Purpose Tactical Cartridge (APTC)</i>
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COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
<i>EU3: .50 Caliber All-Purpose Tactical Cartridge (APTC)</i>	-	0.000	0.000	0.000	-	0.000	0.000	0.000	4.600	8.060	0.000	12.660
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

N/A

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 2040 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition				<b>Project (Number/Name)</b> FA5 / Assured Precision Weapons and Munitions			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
FA5: Assured Precision Weapons and Munitions	-	0.000	0.000	10.171	-	10.171	12.809	14.820	11.828	7.825	0.000	57.453
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The objective of this advanced component development and prototyping effort is to identify, evaluate, mature, test, and demonstrate various assured precision prototype technologies in weapons and munitions systems to prove component and subsystem maturity in a system-of-systems environment and to reduce subsequent Program of Record (PoR) integration risk. Assured Precision Weapons and Munitions are an integral part of US military strategy and continue to enable combat overmatch and dominance across the Land Component battlespace. Unhindered access to trusted Positioning, Navigation, and Timing (PNT) information under conditions where existing space based PNT (i.e. P(Y)-Code Global Positioning System (GPS)) may be limited or denied has created the need to develop, prototype, and evaluate new/emerging Assured PNT capabilities (including M-Code GPS and Pseudolites) into both PGMs and Weapons operating in a complex system-of-systems environment. This imperative is reinforced by Public Law 111-383 Section 913 which mandates the use of Air Force-developed M-Code GPS capabilities in all systems fielded FY 2018 and beyond unless a waiver is obtained from the Secretary of Defense. As such, both precision weapon and munition PoRs must coordinate with the development and technology delivery activities of the Air Force's Military GPS User Equipment (MGUE) program and the Army's Assured PNT program to protect and insure critical precision-based Joint warfighting capabilities as well as maximizing effectiveness and efficiency of US taxpayer investments across multiple Lethality portfolios.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<b>Title:</b> Assured Precision Weapons and Munitions Integrated Product Support	-	-	1.614
<b>Description:</b> Provide assured precision weapons and munitions technical subject matter expertise.			
<b>FY 2017 Plans:</b> The subject matter experts will coordinate with and support the development and technology delivery activities of the Air Force's Military GPS User Equipment (MGUE) program and the Army's Assured PNT program including participation in design reviews, evaluation and formal feedback on systems requirements and technology performance, component and subsystem architecture input essential for precision weapons and munitions operating in a system-of-systems environment, and configuration management of the evolving Joint Common GPS Specification and Interface Control Document for Precision Guided Munitions.			
<b>Title:</b> Accelerate and Demonstrate M-Code GPS for Precision Guidance Kit	-	-	8.557
<b>Description:</b> Demonstrate, and evaluate the impact of prototype M-Code GPS MGUE Increment 1 technology on Precision Guidance Kit (PGK) and associated fuze setter, which will also benefit other future Indirect Fire munitions.			
<b>FY 2017 Plans:</b>			

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Army		<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> FA5 / <i>Assured Precision Weapons and Munitions</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
Identify corresponding risks and modify associated component/sub-system requirements that reflect demanding gun-hardened, hot-start, high-spin post-launch munition environments to accelerate the subsequent adoption and integration of MGUE technology into PGK. Identify risks and develop prototypes M-Code capable setter system that is backward compatible with legacy systems.				
<b>Accomplishments/Planned Programs Subtotals</b>		-	-	10.171
<b>C. Other Program Funding Summary (\$ in Millions)</b> N/A				
<b>Remarks</b>				
<b>D. Acquisition Strategy</b> The Planned Acquisition Strategy for the Assured Precision Weapons and Munitions program is to utilize the Defense Ordnance Technology Consortium (DOTC) Section 845 Other Transaction Authority (OTA) contract mechanism to obtain prototypes to demonstrate and evaluate the maturity of the M-Code GPS on Precision Cannon Munitions.				
<b>E. Performance Metrics</b> N/A				

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Army** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> FA5 / Assured Precision Weapons and Munitions
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<b>Product Development (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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			
M-Code Technology Maturation for PGK	C/TBD	TBD : TBD	0.000	-		-		4.000	Jan 2017	-		4.000	0	4.000	4.000
M-Code Technology Maturation & Development for Fuze Setter	MIPR	ARDEC : Picatinny, NJ	0.000	-		-		4.177	Jan 2017	-		4.177	0	4.177	4.177
<b>Subtotal</b>			0.000	-		-		8.177		-		8.177	0.000	8.177	8.177

<b>Support (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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	MIPR	PEO Ammo : Picatinny, NJ	0.000	-		-		0.508	Nov 2016	-		0.508	0	0.508	0.508
Assured Precision Weapons and Munitions IPT Support	MIPR	Various : Various	0.000	-		-		1.106	Dec 2016	-		1.106	0	1.106	1.106
Assured Technologies Engineering Support	MIPR	ARDEC : Picatinny, NJ	0.000	-		-		0.380	Jan 2017	-		0.380	0	0.380	0.380
<b>Subtotal</b>			0.000	-		-		1.994		-		1.994	0.000	1.994	1.994

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>		0.000	-	0.000	10.171	-	10.171	0.000	10.171

**Remarks**

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

<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / Tank and Medium Caliber Ammunition	<b>Project (Number/Name)</b> FA5 / Assured Precision Weapons and Munitions
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Event Name	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Assured Precision Weapons and Munitions IPT Support																												
Accelerate/Demo M-Code GPS for Precision Guidance Kit																												
Pseudolite related PGM Integration Risk Mitigation																												
Assured PNT Weapon & Munition adv development, prototyping, eva																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2017 Army</b>		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	<b>Project (Number/Name)</b> FA5 / <i>Assured Precision Weapons and Munitions</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Assured Precision Weapons and Munitions IPT Support	1	2017	4	2021
Accelerate/Demo M-Code GPS for Precision Guidance Kit	1	2017	3	2018
Pseudolite related PGM Integration Risk Mitigation	1	2018	4	2021
Assured PNT Weapon & Munition adv development, prototyping, eval	1	2018	4	2021

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