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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2019 Army **Date:** February 2018

<b>Appropriation/Budget Activity</b> 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Close Combat Systems Adv Dev							
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	-	65.062	72.909	45.254	-	45.254	98.627	99.600	90.277	86.116	Continuing	Continuing
606: Cntrmn/Barrier Adv Dev	-	0.000	4.149	2.968	-	2.968	12.144	16.802	11.859	9.880	0.000	57.802
EK7: Area Denial Capability Development	-	65.062	68.760	42.286	-	42.286	86.483	82.798	78.418	76.236	Continuing	Continuing

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

This Program Element (PE) provides for the Concept Exploration and Refinement of Terrain Shaping Obstacles. This PE develops alternatives to the Family of Scatterable Mines systems.

Project 606 enables component development of a new detection capability for explosive hazards, improvised explosive devices (IED), and components in support of route clearance operations. These capabilities will enhance the effectiveness of the Route Clearance Platoon within the Engineer Company, the Brigade Combat Team as well as other related Army missions.

Project EK7 Area Denial Capability Development will evaluate integrated technologies and prototype systems in a realistic operating environment to expedite technology transition for Terrain Shaping Obstacles. The obstacles will deny the enemy terrain and freedom of action while allowing friendly forces to maneuver freely within the same battle space. Area Denial Capability Development provides controlled scalable effects against mounted enemy forces that disrupt, turn, fix, delay or block their ability to maneuver. Area Denial Capability Development enables the Combatant Commander to shape the battle space of an area without exposing friendly forces to enemy engagement, and to actively detect and engage the enemy at all operational ranges. Area Denial Capability Development will utilize an open system, modular architecture to facilitate future development, maintenance, repair, and product improvements.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>
Previous President's Budget	72.117	72.909	76.845	-	76.845
Current President's Budget	65.062	72.909	45.254	-	45.254
Total Adjustments	-7.055	0.000	-31.591	-	-31.591
• Congressional General Reductions	-0.035	-	-	-	-
• Congressional Directed Reductions	-	-	-	-	-
• Congressional Rescissions	-	-	-	-	-
• Congressional Adds	-	-	-	-	-
• Congressional Directed Transfers	-	-	-	-	-
• Reprogrammings	-4.280	-	-	-	-
• SBIR/STTR Transfer	-2.740	-	-	-	-
• Adjustments to Budget Years	-	-	-31.591	-	-31.591

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603619A / Close Combat Systems Adv Dev	
<b>Change Summary Explanation</b> FY 2017 Project 606 reprogramming removed funding in the amount of \$3.612 million. FY 2017 Project EK7 reprogramed funds in the amount of \$0.668 million to Project ER2. FY 2017 Project EK7 budget delta in the amount of -\$2.597 million is attributable to SBIR/STTR reductions; FFRDC reduction in the amount of \$0.033 million. The FY 2019 Project EK7 funding request was reduced by \$31.410 million to account for the availability of prior year execution balances. The FY 2019 Project 606 funding was reduced by \$0.181 million to account for the availability of prior year execution balances. .		

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603619A / Close Combat Systems Adv Dev				Project (Number/Name) 606 / Cntrmn/Barrier Adv Dev			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
606: Cntrmn/Barrier Adv Dev	-	0.000	4.149	2.968	-	2.968	12.144	16.802	11.859	9.880	0.000	57.802
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		
A. Mission Description and Budget Item Justification												
Project 606 Countermine/Barrier Advanced Development enables development and evaluation of technologies that will perform detection, neutralization, and clearing of landmines and Improvised Explosive Devices (IEDs) at operational speeds.												
The Forward Reconnaissance and Explosive Hazard Detection (FREHD) system is a suite of four capabilities for use by route clearance patrols to provide standoff detection of explosive hazards: vehicle mounted anomaly detection; pinpoint explosive hazard detection; explosive hazard vapor and particle detection; and remote visualization. FREHD increases the rate of advance of the route clearance formation while removing Soldiers and equipment from the proximity of blast and fragmentation.												
The FY 2019 Base Research, Development, Test & Evaluation (RDTE) dollars in the amount of \$2.968 million supports the Milestone Decision Authority (MDA) delegation, the Materiel Development Decision (MDD), Analysis of Alternatives (AoA), and Milestone documentation in preparation for the initiation of the Technology Maturation and Risk Reduction (TMRR) phase for the Forward Reconnaissance and Explosive Hazard Detection (FREHD) system.												
B. Accomplishments/Planned Programs (\$ in Millions)										FY 2017	FY 2018	FY 2019
Title: HMDS System Engineering and Program Management										-	1.435	-
Description: Supports System Engineering and Program Management												
FY 2018 Plans: Supports System Engineering and Program Management												
FY 2018 to FY 2019 Increase/Decrease Statement: In FY19, HMDS has no requirement.												
Title: HMDS Explosive Hazard Detection Technology Development										-	2.440	-
Description: Explosive Hazard Detection Technology Analysis												
FY 2018 Plans: Explosive Hazard Detection development and evaluation of evolving technologies												
FY 2018 to FY 2019 Increase/Decrease Statement:												

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2019 Army										<b>Date:</b> February 2018		
<b>Appropriation/Budget Activity</b> 2040 / 4				<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Close Combat Systems Adv Dev				<b>Project (Number/Name)</b> 606 / Cntrmn/Barrier Adv Dev				
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>										<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>
In FY19, HMDS has no requirement.												
<b>Title:</b> HMDS Explosive Hazard Detection Test and Evaluation										-	0.274	-
<b>Description:</b> Explosive Hazard Detection Test and Evaluation												
<b>FY 2018 Plans:</b> Conduct testing of candidate technologies.												
<b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> in FY19, HMDS has no requirement.												
<b>Title:</b> Forward Reconnaissance and Explosive Hazard Detection (FREHD)										-	-	2.968
<b>FY 2019 Plans:</b> Conduct the Milestone Decision Authority (MDA) delegation, the Materiel Development Decision (MDD), the Analysis of Alternatives (AoA) and the Milestone documentation for the initiation of Technology Maturation and Risk Reduction (TMRR)												
<b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> Forward Reconnaissance and Explosive Hazard Detection (FREHD) will be a new start in FY 2019.												
<b>Accomplishments/Planned Programs Subtotals</b>										-	4.149	2.968
<b>C. Other Program Funding Summary (\$ in Millions)</b>												
<b>Line Item</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	
• 415: PE 0604808A Proj 415 Mine Neutralization/Detection	29.403	19.848	39.364	-	39.364	34.669	41.709	45.644	44.857	Continuing	Continuing	
• R64001: HUSKY MOUNTED DETECTION SYSTEM (HMDS)	0.274	21.695	40.834	-	40.834	53.741	75.450	45.454	43.980	0.000	281.428	
<b>Remarks</b> PE 0604808 Project 415 Mine Neutralization and Detection is the engineering development follow-on to this funding line, and is a shared project line. The above profile represents the total line, not only the follow on tasks within this program.												
<b>D. Acquisition Strategy</b> The Acquisition Strategy for Route Clearance Operations will be developed in conjunction with program initiation.												

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2019 Army		<b>Date:</b> February 2018
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / <i>Close Combat Systems Adv Dev</i>	<b>Project (Number/Name)</b> 606 / <i>Cntrmn/Barrier Adv Dev</i>
<p>The Husky Mounted Detection System (HMDS) program is pursuing an acquisition approach that delivers capability to the Warfighter by leveraging the Quick Reaction Capability (QRC) Ground Penetrating Radar (GPR) currently deployed in support of Operation Enduring Freedom (OEF) and Operation Inherent Resolve (OIR). In FY 2018, as part Engineering Development activities, the program will execute an ECP to add a wire detection capability to address evolving threat, and Infrared illumination to enable nighttime operation. A second ECP to improve operational availability of the HMDS during inclement weather and address obsolescence and Cyber Security deficiencies will follow. As part of the Advanced Development activities, the HMDS Program will conduct additional development and evaluation of technologies to address a broader spectrum of emerging threats, interoperability with electronic countermeasures, and detection and neutralization of landmines and Improvised Explosive Devices (IEDs) at operational speeds.</p> <p>The Forward Reconnaissance Explosive Hazard Detection (FREHD) program will conduct an Analysis of Alternatives (AoA) in FY 2019. Results of the AoA will support the development of the acquisition strategy. The requirement identifies four capabilities: Forward Anomaly Detection, Pinpoint Explosive Hazard Detection, Explosive Hazard Vapor and Particle Detection, and Remote Visualization.</p> <p><b><u>E. Performance Metrics</u></b> N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603619A / Close Combat Systems Adv Dev				Project (Number/Name) 606 / Cntrmn/Barrier Adv Dev					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 - HMDS	MIPR	PM Terrestrial Sensors : Fort Belvoir, VA	-	-		0.300		-		-		-	Continuing	Continuing	-
Program Management - FREHD	Allot	PM CCS : Picatinny Arsenal, NJ	-	-		-		0.133	Mar 2019	-		0.133	Continuing	Continuing	-
Subtotal			-	-		0.300		0.133		-		0.133	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
HMDS To Be Determined	TBD	TBD : TBD	-	-		1.742		-		-		-	0.000	1.742	-
Subtotal			-	-		1.742		-		-		-	0.000	1.742	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
HMDS Explosive Hazard Detection - Technology Analysis	MIPR	TRADOC : Ft. Eustis, VA	-	-		0.488		-		-		-	Continuing	Continuing	-
HMDS Explosive Hazard Detection - Engineering Support	MIPR	CERDEC NVESD : Ft. Belvoir, VA	-	-		1.115		-		-		-	Continuing	Continuing	-
HMDS Explosive Hazard Detection - System Analysis and Test Design	FFRDC	IDA : Alexandria, VA	-	-		0.230		-		-		-	Continuing	Continuing	-
FREHD	MIPR	Various : Various	-	-		-		2.835	Mar 2019	-		2.835	0.000	2.835	-
Subtotal			-	-		1.833		2.835		-		2.835	Continuing	Continuing	N/A

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2019 Army</b>												<b>Date:</b> February 2018		
<b>Appropriation/Budget Activity</b> 2040 / 4						<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Close Combat Systems Adv Dev				<b>Project (Number/Name)</b> 606 / Cntrmn/Barrier Adv Dev				

<b>Test and Evaluation (\$ in Millions)</b>				<b>FY 2017</b>		<b>FY 2018</b>		<b>FY 2019 Base</b>		<b>FY 2019 OCO</b>		<b>FY 2019 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>
HMDS Explosive Hazard Detection	MIPR	ATEC : Alexandria, VA	-	-		0.274		-		-		-	Continuing	Continuing	-
<b>Subtotal</b>			-	-		0.274		-		-		-	Continuing	Continuing	N/A

	<b>Prior Years</b>	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019 Base</b>	<b>FY 2019 OCO</b>	<b>FY 2019 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	-	-	4.149	2.968	-	2.968	Continuing	Continuing	N/A

**Remarks**

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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2019 Army</b>			<b>Date:</b> February 2018		
<b>Appropriation/Budget Activity</b> 2040 / 4		<b>R-1 Program Element (Number/Name)</b> PE 0603619A / Close Combat Systems Adv Dev		<b>Project (Number/Name)</b> 606 / Cntrmn/Barrier Adv Dev	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	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
<b>HMDS</b>																												
Explosive Hazard Detection - technology development, test and ev																												
Advanced Development efforts for technology transition																												
<b>Forward Reconnaissance and Explosive Hazard Detection (FREHD)</b>																												
FREHD Materiel Development Decision (MDD)																												
FREHD Analysis of Alternatives (AoA)																												
FREHD Milestone (MS) A																												
FREHD Technology Maturation and Risk Reduction (TMRR) Contract Award																												
FREHD Technology Maturation and Risk Reduction (TMRR)																												
FREHD Milestone (MS) B																												
FREHD Engineering Manufacturing Development (EMD) Contract Award																												
FREHD Engineering Manufacturing Development (EMD)																												



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2019 Army			<b>Date:</b> February 2018
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / <i>Close Combat Systems Adv Dev</i>	<b>Project (Number/Name)</b> 606 / <i>Cntrmn/Barrier Adv Dev</i>	

**Schedule Details**

<b>Events</b>	<b>Start</b>		<b>End</b>	
	<b>Quarter</b>	<b>Year</b>	<b>Quarter</b>	<b>Year</b>
HMDS	1	2018	4	2022
Explosive Hazard Detection - technology development, test and evaluation	2	2017	4	2019
Advanced Development efforts for technology transition	1	2019	4	2022
Forward Reconnaissance and Explosive Hazard Detection (FREHD)	1	2019	4	2023
FREHD Materiel Development Decision (MDD)	2	2019	2	2019
FREHD Analysis of Alternatives (AoA)	2	2019	2	2020
FREHD Milestone (MS) A	2	2020	2	2020
FREHD Technology Maturation and Risk Reduction (TMRR) Contract Award	2	2020	2	2020
FREHD Technology Maturation and Risk Reduction (TMRR)	3	2020	4	2022
FREHD Milestone (MS) B	2	2022	2	2022
FREHD Engineering Manufacturing Development (EMD) Contract Award	2	2023	2	2023
FREHD Engineering Manufacturing Development (EMD)	3	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603619A / Close Combat Systems Adv Dev				Project (Number/Name) EK7 / Area Denial Capability Development			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EK7: Area Denial Capability Development	-	65.062	68.760	42.286	-	42.286	86.483	82.798	78.418	76.236	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This project provides for the development of Terrain Shaping Obstacles.

Area Denial Capability Development will evaluate integrated technologies and prototype systems in a realistic operating environment to expedite technology transition for Terrain Shaping Obstacles. The obstacles will deny the enemy terrain and freedom of action while allowing friendly forces to maneuver freely within the same battlespace. Area Denial Capability Development provides controlled scalable effects against mounted enemy forces that disrupt, turn, fix, delay or block their ability to maneuver. Area Denial Capability Development enables the Combatant Commander to shape the battle space of an area without exposing friendly forces to enemy engagement, and to actively detect and engage the enemy at all operational ranges. Area Denial Capability Development will utilize an open system, modular architecture to facilitate future development, maintenance, repair, and product improvements.

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

	<b>FY 2017</b>	<b>FY 2018</b>	<b>FY 2019</b>
<b>Title:</b> Area Denial Capability Development  <b>Description:</b> Develop and build system and sub-system level concepts that will be evaluated for affordability, feasibility, and technical maturity. Complete competitive development of systems and perform initiatives to mature technical feasibility and reduce risk.  <b>FY 2018 Plans:</b> Award contract agreements to conduct analysis on delivery bomb unit and integration with aircraft. Develop the Capability Development Document (CDD) requirements, conduct technical activities to reduce program technical and cost risk.  <b>FY 2019 Plans:</b> Will conduct analysis of munitions delivery system alternatives. Prepare for Milestone A decision to develop Terrain Shaping Obstacle munitions. Will award contract agreements to mature munitions technology and reduce program technical and cost risk.  <b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> Area Denial Capability Development was decreased to account for the availability of prior year execution balances.	42.770	51.386	26.671
<b>Title:</b> Engineering Support  <b>Description:</b> Provide Engineering Support.	13.793	10.156	10.739

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Close Combat Systems Adv Dev	Project (Number/Name) EK7 / Area Denial Capability Development		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<b>FY 2018 Plans:</b> Engineering support to execute contract agreements to conduct analysis on delivery bomb unit and integration with aircraft. Continue developing models and simulations, achieve Milestone A decision, conduct technology readiness assessments, and support requirements development.				
<b>FY 2019 Plans:</b> Will provide engineering support to analyze munitions delivery system alternatives, achieve Milestone A decision to develop Terrain Shaping Obstacle munitions, and award contract agreements to mature munitions technology and reduce program technical and cost risk.				
<b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> Engineering Support cost was increased due to updated cost estimate.				
<b>Title:</b> Test and Evaluation <b>Description:</b> Provide support to Contractor/Government test Activities.		0.336	-	-
<b>Title:</b> Program Management and Oversight <b>Description:</b> Program Management and Support		8.163	7.218	4.876
<b>FY 2018 Plans:</b> Program Management support for technical/engineering analysis of the materiel solution and management of contract agreements to conduct analysis on delivery bomb unit and integration with aircraft. Prepare the requirements for two Technology Maturation and Risk Reduction (TMRR) phase contracts/agreements.				
<b>FY 2019 Plans:</b> Will provide Program Management support to analyze munitions delivery system alternatives, achieve Milestone A decision to develop Terrain Shaping Obstacle munitions, and award contract agreements to mature munitions technology and reduce program technical and cost risk. Will conduct industry engagements and award Technology Maturation and Risk Reduction phase contracts/agreements to develop Terrain Shaping Obstacle munitions.				
<b>FY 2018 to FY 2019 Increase/Decrease Statement:</b> Program Management and Oversight costs were decreased due to reduced internal operating budget.				
Accomplishments/Planned Programs Subtotals		65.062	68.760	42.286
C. Other Program Funding Summary (\$ in Millions)				
N/A				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2019 Army		<b>Date:</b> February 2018
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / <i>Close Combat Systems Adv Dev</i>	<b>Project (Number/Name)</b> EK7 / <i>Area Denial Capability Development</i>
<b>C. Other Program Funding Summary (\$ in Millions)</b>		
<b>Remarks</b> N/A		
<b>D. Acquisition Strategy</b> The Dominating Mobility Through Terrain Shaping and Engagement (DMTTS&E) Initial Capabilities Document (ICD) was approved by the Joint Requirements Oversight Council (JROC) on 3 October 2014. The DMTTS&E ICD documents Terrain Shaping Obstacle (TSO) requirements at all operational ranges including those within line-of-sight and those that are beyond line-of-sight. The Army awarded four concept prototype contracts/agreements to develop representative prototypes (hardware and/or models) which were used to assess the TSO concepts, technical risks, and costs of potential munitions systems and associated capabilities. The Army intends to develop the TSO munitions system and associated capabilities. The TSO system will eventually be packaged into various delivery methods for employment at all operational ranges; however, the Army plans to initially demonstrate the TSO capability at close operational ranges. The Army intends to competitively award up to two Technology Maturation and Risk Reduction (TMRR) contracts/agreements in FY 2019 to develop competing prototypes of the TSO munitions and associated capabilities, which includes close-range delivery mechanisms. As the munitions system matures, the items will be available for integration into additional delivery methods for employment across the entire range of operations.		
<b>E. Performance Metrics</b> N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603619A / Close Combat Systems Adv Dev				Project (Number/Name) EK7 / Area Denial Capability Development					
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	MIPR	PM-CCS : Picatinny Arsenal, NJ	3.841	8.163		4.474		3.248		-		3.248	Continuing	Continuing	-
SBIR/STTR/FFRDC	TBD	PM CCS : Picatinny Arsenal, NJ	-	-		2.750		1.628		-		1.628	Continuing	Continuing	-
Subtotal			3.841	8.163		7.224		4.876		-		4.876	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
Prototype Development A	SS/CPFF	Orbital ATK : Plymouth, MN	8.351	6.453	Jun 2017	-		-		-		-	0.000	14.804	-
Prototype Development B	SS/CPFF	Textron Defense Systems : Wilmington, MA	7.829	7.669	Jun 2017	-		-		-		-	0.000	15.498	-
Prototype Development C	SS/FFP	Fantastic Data LLC : San Fransisco, CA	7.363	3.117	Jun 2017	-		-		-		-	0.000	10.480	-
Prototype Development D	SS/CPFF	Northrop Grumman Systems Corporation : Redondo Beach, CA	3.028	3.945	Jun 2017	-		-		-		-	0.000	6.973	-
Warhead Technology Study	SS/CPFF	Various : Various	-	1.586	Aug 2017	-		-		-		-	0.000	1.586	-
Top Attack Prototype Development A	SS/CPFF	Orbital ATK : Plymouth, MN	-	8.000	Aug 2017	-		-		-		-	0.000	8.000	-
Top Attack Prototype Development B	SS/CPFF	Textron Defense Systems : Wilmington, MA	-	10.000	Sep 2017	-		-		-		-	0.000	10.000	-
Technology Maturation Risk Reduction (TMRR) Development A	C/TBD	TBD : TBD	-	-		25.690	Jun 2018	13.336	Jun 2019	-		13.336	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603619A / Close Combat Systems Adv Dev				Project (Number/Name) EK7 / Area Denial Capability Development					
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
Technology Maturation Risk Reduction (TMRR) Development B	C/TBD	TBD : TBD	-	-		25.690	Jun 2018	13.335	Jun 2019	-		13.335	Continuing	Continuing	-
ARL Common Sensor Radio Development	MIPR	ARL : ADELPHI,MD	-	2.000		-		-		-		-	0.000	2.000	-
Subtotal			26.571	42.770		51.380		26.671		-		26.671	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Engineering Support	MIPR	ARDEC : Picatinny Arsenal, NJ	3.484	6.336		5.110		6.127		-		6.127	Continuing	Continuing	-
ARDEC Warhead Technologies Study	MIPR	ARDEC : Picatinny Arsenal, NJ	-	1.090		-		-		-		-	2.700	3.790	-
Dynamic Capabilities	MIPR	ARDEC : Picatinny Arsenal, NJ	-	0.174		-		-		-		-	0.000	0.174	-
ARDEC Threat Detection Study	MIPR	ARDEC : Picatinny Arsenal, Nj	-	0.384		-		-		-		-	0.514	0.898	-
ARDEC Counter Countermeasures Study	MIPR	ARDEC : Picatinny Arsenal, NJ	-	0.405		-		-		-		-	0.570	0.975	-
CERDEC Engineering Support	MIPR	CERDEC : Fort Belvoir, VA	0.497	0.562		0.275		0.921		-		0.921	Continuing	Continuing	-
NVESD Engineering Support	MIPR	NVESD : Fort Belvoir, VA	0.440	0.453		0.800		0.518		-		0.518	Continuing	Continuing	-
Mitre Engineering Support (C4)	FFRDC	Mitre : McLean, VA	0.863	1.834	Oct 2017	1.000		1.080		-		1.080	Continuing	Continuing	-
Fibertek, INC. Operational Contractor Support	C/CPFF	FIBERTEK, INC. : Herndon, VA	0.131	0.470	May 2017	0.500		-		-		-	0.000	1.101	-
Millenium Program Support	C/FFP	Millennium Corporation : Picatinny Arsenal, NJ	-	0.023	Jan 2017	-		-		-		-	0.000	0.023	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603619A / Close Combat Systems Adv Dev				Project (Number/Name) EK7 / Area Denial Capability Development					
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
ARL Engineering Support	MIPR	ARMY RESEARCH LABORATORY (ARL) : Adelphi, MD	0.633	0.853		0.850		0.808		-		0.808	Continuing	Continuing	-
AMSAA Engineering Support	MIPR	Army Materiel Systems Analysis Activity (AMSAA) : Aberdeen, MD	0.663	-		0.215		-		-		-	0.000	0.878	-
TRAC Analysis Support	MIPR	TRADOC Analysis Center (TRAC) : White Sands, NM	2.200	-		-		-		-		-	0.000	2.200	-
USAF Engineering and Integration Support	SS/CPFF	Air Force Life Cycle Management Center, Armament Systems Development Division : Eglin AFB, FL	1.191	1.209	Aug 2017	1.200		1.285		-		1.285	Continuing	Continuing	-
USN Engineering and Integration Support	MIPR	TBD : TBD	-	-		0.206		-		-		-	Continuing	Continuing	-
Subtotal			10.102	13.793		10.156		10.739		-		10.739	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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
Prototype Development Demonstration	MIPR	USAF 96th Test Squadron / OGEX : Eglin AFB, FL	0.429	0.336		-		-		-		-	Continuing	Continuing	-
Subtotal			0.429	0.336		-		-		-		-	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			40.943	65.062		68.760		42.286		-		42.286	Continuing	Continuing	N/A

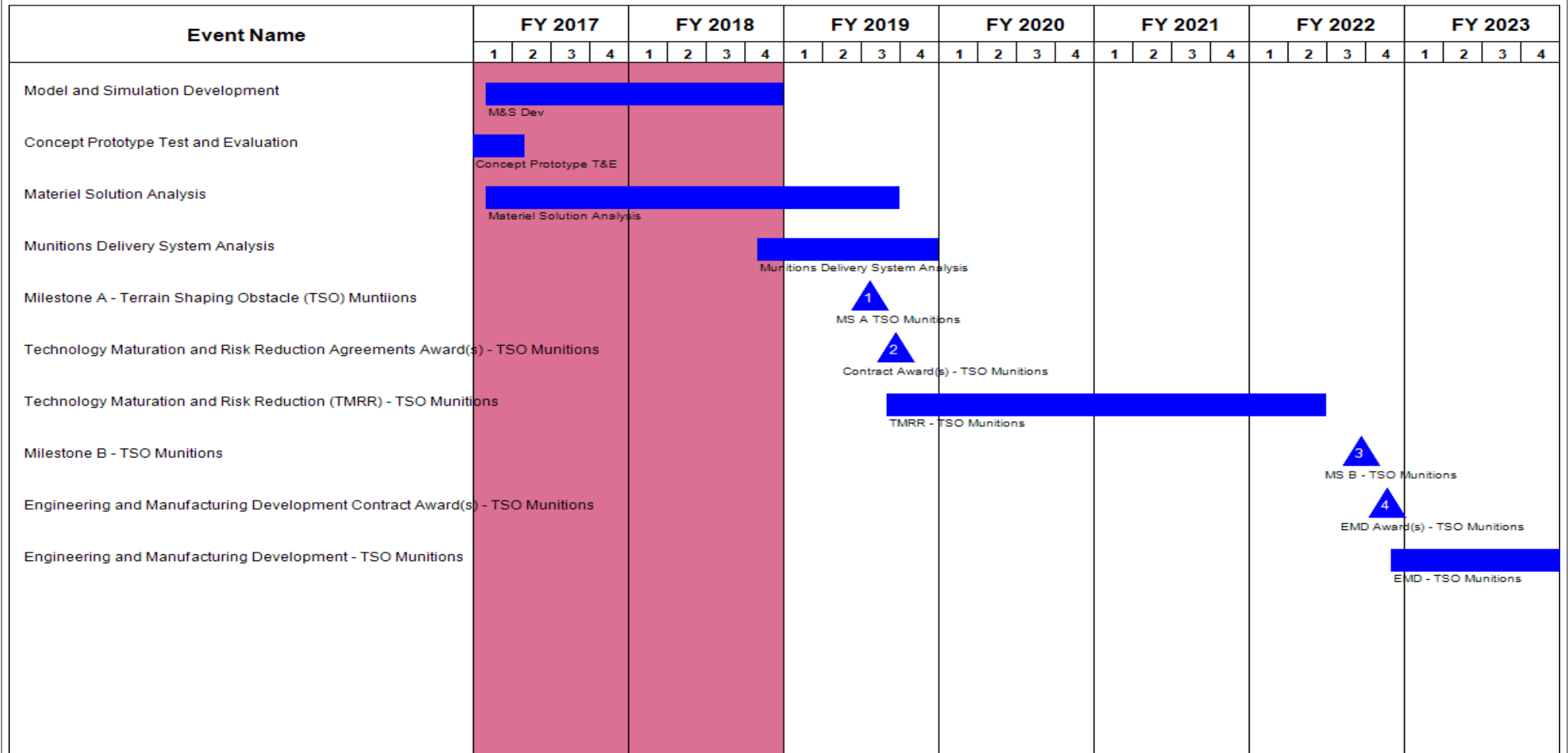
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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army							Date: February 2018			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603619A / Close Combat Systems Adv Dev			Project (Number/Name) EK7 / Area Denial Capability Development			
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Remarks										



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<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2019 Army</b>			<b>Date: February 2018</b>		
<b>Appropriation/Budget Activity</b> 2040 / 4		<b>R-1 Program Element (Number/Name)</b> PE 0603619A / <i>Close Combat Systems Adv Dev</i>		<b>Project (Number/Name)</b> EK7 / <i>Area Denial Capability Development</i>	



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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2019 Army			<b>Date:</b> February 2018
<b>Appropriation/Budget Activity</b> 2040 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0603619A / <i>Close Combat Systems Adv Dev</i>	<b>Project (Number/Name)</b> EK7 / <i>Area Denial Capability Development</i>	

## Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Area Denial Capability Development	2	2025	1	2026
Model and Simulation Development	1	2016	4	2018
Concept Prototype Build	2	2016	4	2016
Concept Prototype Test and Evaluation	1	2017	1	2017
Analysis of Alternatives	1	2016	4	2016
Materiel Solution Analysis	1	2017	3	2019
Munitions Delivery System Analysis	4	2018	4	2019
Milestone A - Terrain Shaping Obstacle (TSO) Munitions	3	2019	3	2019
Technology Maturation and Risk Reduction Agreements Award(s) - TSO Munitions	3	2019	3	2019
Technology Maturation and Risk Reduction (TMRR) - TSO Munitions	3	2019	2	2022
Milestone B - TSO Munitions	3	2022	3	2022
Engineering and Manufacturing Development Contract Award(s) - TSO Munitions	4	2022	4	2022
Engineering and Manufacturing Development - TSO Munitions	4	2022	3	2024