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**Department of Defense
Fiscal Year (FY) 2018 Budget Estimates**

May 2017



Army

Justification Book of

Research, Development, Test & Evaluation, Army

RDT&E – Volume II, Budget Activity 4

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RESEARCH, DEVELOPMENT, TEST AND EVALUATION, ARMY

APPROPRIATION LANGUAGE

For expenses necessary for basic and applied scientific research, development, test and evaluation, including maintenance, rehabilitation, lease, and operation of facilities and equipment, \$9,544,808,000 to remain available for obligation until September 30, 2019.

The following Justification Books were prepared at a cost of \$250,916: Aircraft (ACFT), Missile (MSLS), Weapons & Tracked Combat Vehicles (WTCV), Ammunition (AMMO), Other Procurement Army (OPA) 1 - Tactical & Support Vehicles, Other Procurement Army (OPA) 2 - Communications & Electronics, Other Procurement Army (OPA) 3 & 4 - Other Support Equipment & Spares, Research, Development, Test and Evaluation (RDTE) for: Budget Activity 1, Budget Activity 2, Budget Activity 3, Budget Activity 4, Budget Activity 5A, Budget Activity 5B, Budget Activity 6, and Budget Activity 7.

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FY 2018 RDT&E, ARMY PROGRAM ELEMENT
DESCRIPTIVE SUMMARIES

Introduction and Explanation of Contents

1. **General.** The purpose of this document is to provide summary information concerning the Research, Development, Test and Evaluation, Army program. The descriptive summaries are comprised of R-2 (Army RDT&E Budget Item Justification – program element level), R-2A (Army RDT&E Budget Item Justification – project level), R-3 (Army RDT&E Cost Analysis), R-4 (Schedule Profile Detail) and R-5 (Termination Liability Funding for MDAPs) Exhibits, which provide narrative information on all RDT&E program elements and projects through FY 2018.

2. **Relationship of the FY 2018 Budget Submitted to Congress to the FY 2017 Budget Submitted to Congress.** This paragraph provides a list of program elements/projects that are major new starts, restructures, developmental transitions, and terminated programs. Explanations for these changes can be found in the narrative sections of the Program Element R-2A Exhibits.

A. New Start Programs:

<u>Budget Activity</u>	<u>OSDPE/Project</u>	<u>Project Title</u>
01	0601104A/FF5	Distributed Collaborative Intelligent Systems CTA
01	0601104A/FF7	Internet of Battlefield Things CTA
03	0603001A/FF6	Individual Protection
03	0603009A/FH1	Tractor Hike
04	0603639A/XT5	30mm Anti-Personnel and Counter-Air
04	0603645A/EV7	Combat Vehicle Prototyping
04	0603807A/VS7	MEDEVAC Mission Equipment Package (MEP) - Adv Dev
04	0604017A/FD2	Soldier Robotics Systems
04	0604017A/FD3	Battery Modernization & Interface Standardization
04	0604017A/FD9	Robotics Systems

<u>Budget Activity</u>	<u>OSDPE/Project</u>	<u>Project Title</u>
04	0604117A/FI4	Maneuver – Short Range Air Defense (M-SHORAD)
04	0604120A/EJ3	ANTI-JAM ANTENNA
04	0604121A/FD6	Synthetic Training Environment Refine & Prototype
05	0604601A/FF2	Small Arms Fire Control
05	0604601A/FI2	Lightweight 30mm Cannon
05	0604604A/H07	Family Of Med Tac Veh
05	0604768A/688	ATACMS BLK II
05	0604768A/P01	MULTI - MODE SEEKER DEVELOPMENT AND TEST
05	0604802A/EW1	40mm LV High Explosive Air Burst, XM1166
05	0604802A/FA6	30mm Lethality
05	0604804A/FG4	Ultra-Lightweight Camouflage Net System (ULCANS)
05	0604818A/ER9	Expeditionary Army Command Post
05	0604823A/L87	Hypervelocity Projectile System
05	0604852A/FE8	Vehicle Protection Suite
05	0605013A/VR3	ASMIS-R (REPORTIT)
05	0605037A/EQ6	Evidence Collection and Detainee Processing
05	0605053A/FB2	Man Transportable Robotic System (MTRS) Inc II
05	0605053A/FB3	Robotics Architecture
05	0605053A/FB4	Common Robotic Systems
05	0605053A/FB6	Squad Multipurpose Equipment Transport (SMET)
05	0605053A/FB7	Robotics Enhanced Program (REP)
05	0605053A/FB8	Soldier Borne Sensor (SBS)

<u>Budget Activity</u>	<u>OSDPE/Project</u>	<u>Project Title</u>
05	0605053A/FB9	MTRS Standardization
05	1205117A/FG3	Tractor Bears
06	0606001A/FD4	Military Ground-Based CREW Technology
07	0203735A/280	RECOV VEH IMPROV PROG
07	0203735A/431	M113 IMPROVEMENTS
07	0203743A/FF9	PIM Improvement Program
07	0203802A/788	ATACMS PIP
07	0205412A/EE6	Environmental Information Tech Modernization
07	0303028A/FG2	Counterintelligence & Human Intel Modernization
07	0303140A/FF8	Unit Activity Monitoring (UAM)
07	0305172A/XT9	Combined Advanced Applications

B. Program Element/Project Restructures:

<u>Budget Activity</u>	<u>Old OSDPE/Project: Title</u>	<u>New OSDPE/Project: Title</u>
04	0603308A/990: Space and Missile Defense Integration	1206308A/FE5: Space and Missile Defense Integration
04	0603308A/EB7: Army Space System Enhancement/Integration	1206308A/FE6: Army Space System Enhancement/Integration
04	0305219AMQ1: MQ-1 Gray Eagle – Army UAV (MIP)	0603804A/EW8: Armored Engineer Vehicles
05	0604201A/VU3: Networking and Mission Planning	0604201A/EW7: Degraded Visual Environment
05	0603639A/EB8: OWL for Small Caliber Ammunition	0604802A/EP4: One-Way Luminescence For Small Caliber Ammo
05	0603639A/EU2: Improved Multi-Option Fuze (iMOFA/iMOFM)	0604802A/EU8: Improved Multi-Option Fuze
05	0604827A/S65: Platoon Power Generator	0604827A/EY2: Integrated Soldier Power Data System Core
05	0604827A/S65: Platoon Power Generator	0604827A/EY4: Universal Battery Charger
05	0203735A/EE2: Stryker Improvement	0604852A/XU9: Active Protection System
05	0605013A/738: AcqBiz	0605013A/FE9: ALTESS (P & R Forms)
05	0603627A/E79: Smoke/Obscurant System	0605038A/EQ7: NBC Reconnaissance Vehicle (NBCRV)
05	0605051A/ER8: Common Missile Warning System (CMWS)	0605049A/XT4: Advanced Threat Detection System (ATDS)
05	0303142A/EA3: Transportable Tactical Cmd Comms (T2C2)	0605766A/EX7: Air Vigilance System Development
06	0605898A/M03: Command HQ - MRDC	0605898A/XW7: Command HQ - ARI
06	0605301A/DX2: Army Kwajalein and Mission Support	0606002A/XW9: Reagan Test Site
07	0303142A/253: Dscs-Dcs (Phase II)	1203142A/FE1: Dscs-Dcs (Phase II)
07	0303142A/456: MILSATCOM System Engineering	1203142A/FE2: MILSATCOM System Engineering
07	0303142A/EA3: Transportable Tactical Cmd Comms (T2C2)	1203142A/FE4: Enroute Mission Command
07	0208053A/635: Joint Tact Grd Station P3I (MIP)	1208053A/FE7: Joint Tact Grd Station-P3I(MIP)
07	0305219A/RQ7: RQ-7 Shadow UAV	0607143A/EX1: Unmanned Aircraft Systems Universal Products

C. Program Terminations:

<u>Budget Activity</u>	<u>OSDPE/Project</u>	<u>OSDPE Title/Project Title</u>
01	0601104A/H53	University & Industry Rsch Ctrs / Army High Performance Computing Research Center
01	0601104A/H53	University & Industry Rsch Ctrs / Micro-autonomous Systems Technology (MAST) CTA
05	0604601A/S62	Infantry Support Weapons / Counter-Defilade Target Engagement - SDD

- 3. Classification:** This document contains no classified data. Appropriately cleared individuals can obtain further information on Classified/Special Access Programs by contacting the Department of the Army (ASA(ALT)) Special Programs Office.

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Department of Defense
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 Exhibit R-1 FY 2018 President's Budget Request
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 (Dollars in Thousands)

26 Apr 2017

Appropriation	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO
Research, Development, Test & Eval, Army	7,861,744	7,547,794	7,897,415	1,500	233,300	-78,700	154,600
Total Research, Development, Test & Evaluation	7,861,744	7,547,794	7,897,415	1,500	233,300	-78,700	154,600

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Appropriation	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Research, Development, Test & Eval, Army	7,627,994	8,130,715	-78,700	8,052,015	9,425,440	119,368	9,544,808
Total Research, Development, Test & Evaluation	7,627,994	8,130,715	-78,700	8,052,015	9,425,440	119,368	9,544,808

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Summary Recap of Budget Activities	FY 2016	FY 2017	FY 2017	FY 2017	FY 2017	FY 2017	FY 2017
	Base + OCO	PB Request with CR Adj Base	Total PB Requests* with CR Adj Base	PB Request with CR Adj OCO	Total PB Requests* with CR Adj OCO	Less Enacted Div B P.L.114-254** OCO	Remaining Req with CR Adj OCO
Basic Research	450,831	428,943	428,943				
Applied Research	1,070,349	907,574	907,574				
Advanced Technology Development	1,113,746	930,065	943,365				
Advanced Component Development & Prototypes	499,287	550,635	566,835	9,375	25,395		25,395
System Development & Demonstration	2,202,652	2,265,094	2,393,383	84,043	288,443	-78,700	209,743
RDT&E Management Support	1,259,926	1,136,134	1,161,991				
Operational Systems Development	1,264,953	1,296,954	1,462,929	7,104	18,484		18,484
Undistributed		32,395	32,395	-99,022	-99,022		-99,022
Total Research, Development, Test & Evaluation	7,861,744	7,547,794	7,897,415	1,500	233,300	-78,700	154,600
<u>Summary Recap of FYDP Programs</u>							
General Purpose Forces	802,086	618,038	697,138		4,530		4,530
Intelligence and Communications	400,329	238,711	268,755	7,104	8,854		8,854
Research and Development	6,596,225	6,591,738	6,832,215	93,418	318,938	-78,700	240,238
Central Supply and Maintenance	58,503	62,287	62,287				
Administration and Associated Activities	65	32,395	32,395	-99,022	-99,022		-99,022
Space							
Classified Programs	4,536	4,625	4,625				
Total Research, Development, Test & Evaluation	7,861,744	7,547,794	7,897,415	1,500	233,300	-78,700	154,600

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	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<u>Summary Recap of Budget Activities</u>							
Basic Research	428,943	428,943		428,943	430,022		430,022
Applied Research	907,574	907,574		907,574	889,182		889,182
Advanced Technology Development	930,065	943,365		943,365	1,070,977		1,070,977
Advanced Component Development & Prototypes	560,010	592,230		592,230	890,889	18,000	908,889
System Development & Demonstration	2,427,837	2,681,826	-78,700	2,603,126	3,012,840	57,840	3,070,680
RDT&E Management Support	1,136,134	1,161,991		1,161,991	1,253,845		1,253,845
Operational Systems Development	1,304,058	1,481,413		1,481,413	1,877,685	43,528	1,921,213
Undistributed	-66,627	-66,627		-66,627			
Total Research, Development, Test & Evaluation	7,627,994	8,130,715	-78,700	8,052,015	9,425,440	119,368	9,544,808
<u>Summary Recap of FYDP Programs</u>							
General Purpose Forces	618,038	701,668		701,668	710,401	15,000	725,401
Intelligence and Communications	245,815	277,609		277,609	370,519	29,728	400,247
Research and Development	6,763,856	7,151,153	-78,700	7,072,453	8,215,942	74,640	8,290,582
Central Supply and Maintenance	62,287	62,287		62,287	60,877		60,877
Administration and Associated Activities	-66,627	-66,627		-66,627			
Space					60,547		60,547
Classified Programs	4,625	4,625		4,625	7,154		7,154
Total Research, Development, Test & Evaluation	7,627,994	8,130,715	-78,700	8,052,015	9,425,440	119,368	9,544,808

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<u>Summary Recap of Budget Activities</u>							
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RDT&E Management Support	1,259,926	1,136,134	1,161,991				
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Research and Development	6,596,225	6,591,738	6,832,215	93,418	318,938	-78,700	240,238
Central Supply and Maintenance	58,503	62,287	62,287				
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Space							
Classified Programs	4,536	4,625	4,625				
Total Research, Development, Test & Evaluation	7,861,744	7,547,794	7,897,415	1,500	233,300	-78,700	154,600

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Summary Recap of Budget Activities	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Basic Research	428,943	428,943		428,943	430,022		430,022
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Advanced Technology Development	930,065	943,365		943,365	1,070,977		1,070,977
Advanced Component Development & Prototypes	560,010	592,230		592,230	890,889	18,000	908,889
System Development & Demonstration	2,427,837	2,681,826	-78,700	2,603,126	3,012,840	57,840	3,070,680
RDT&E Management Support	1,136,134	1,161,991		1,161,991	1,253,845		1,253,845
Operational Systems Development	1,304,058	1,481,413		1,481,413	1,877,685	43,528	1,921,213
Undistributed	-66,627	-66,627		-66,627			
Total Research, Development, Test & Evaluation	7,627,994	8,130,715	-78,700	8,052,015	9,425,440	119,368	9,544,808
<u>Summary Recap of FYDP Programs</u>							
General Purpose Forces	618,038	701,668		701,668	710,401	15,000	725,401
Intelligence and Communications	245,815	277,609		277,609	370,519	29,728	400,247
Research and Development	6,763,856	7,151,153	-78,700	7,072,453	8,215,942	74,640	8,290,582
Central Supply and Maintenance	62,287	62,287		62,287	60,877		60,877
Administration and Associated Activities	-66,627	-66,627		-66,627			
Space					60,547		60,547
Classified Programs	4,625	4,625		4,625	7,154		7,154
Total Research, Development, Test & Evaluation	7,627,994	8,130,715	-78,700	8,052,015	9,425,440	119,368	9,544,808

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Appropriation: 2040A Research, Development, Test & Eval, Army

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	Se c
1	0601101A	In-House Laboratory Research	01	12,525	12,381	12,381					U
2	0601102A	Defense Research Sciences	01	271,933	253,116	253,116					U
3	0601103A	University Research Initiatives	01	67,225	69,166	69,166					U
4	0601104A	University and Industry Research Centers	01	99,148	94,280	94,280					U
		Basic Research		450,831	428,943	428,943					
5	0602105A	Materials Technology	02	67,806	31,533	31,533					U
6	0602120A	Sensors and Electronic Survivability	02	57,202	36,109	36,109					U
7	0602122A	TRACTOR HIP	02	6,879	6,995	6,995					U
8	0602211A	Aviation Technology	02	58,497	65,914	65,914					U
9	0602270A	Electronic Warfare Technology	02	18,502	25,466	25,466					U
10	0602303A	Missile Technology	02	51,801	44,313	44,313					U
11	0602307A	Advanced Weapons Technology	02	36,906	28,803	28,803					U
12	0602308A	Advanced Concepts and Simulation	02	26,886	27,688	27,688					U
13	0602601A	Combat Vehicle and Automotive Technology	02	95,763	67,959	67,959					U
14	0602618A	Ballistics Technology	02	118,221	85,436	85,436					U
15	0602622A	Chemical, Smoke and Equipment Defeating Technology	02	3,713	3,923	3,923					U
16	0602623A	Joint Service Small Arms Program	02	5,270	5,545	5,545					U
17	0602624A	Weapons and Munitions Technology	02	81,447	53,581	53,581					U

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Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se c
1	0601101A	In-House Laboratory Independent Research	01	12,381	12,381		12,381	12,010		12,010	U
2	0601102A	Defense Research Sciences	01	253,116	253,116		253,116	263,590		263,590	U
3	0601103A	University Research Initiatives	01	69,166	69,166		69,166	67,027		67,027	U
4	0601104A	University and Industry Research Centers	01	94,280	94,280		94,280	87,395		87,395	U
		Basic Research		428,943	428,943		428,943	430,022		430,022	
5	0602105A	Materials Technology	02	31,533	31,533		31,533	29,640		29,640	U
6	0602120A	Sensors and Electronic Survivability	02	36,109	36,109		36,109	35,730		35,730	U
7	0602122A	TRACTOR HIP	02	6,995	6,995		6,995	8,627		8,627	U
8	0602211A	Aviation Technology	02	65,914	65,914		65,914	66,086		66,086	U
9	0602270A	Electronic Warfare Technology	02	25,466	25,466		25,466	27,144		27,144	U
10	0602303A	Missile Technology	02	44,313	44,313		44,313	43,742		43,742	U
11	0602307A	Advanced Weapons Technology	02	28,803	28,803		28,803	22,785		22,785	U
12	0602308A	Advanced Concepts and Simulation	02	27,688	27,688		27,688	28,650		28,650	U
13	0602601A	Combat Vehicle and Automotive Technology	02	67,959	67,959		67,959	67,232		67,232	U
14	0602618A	Ballistics Technology	02	85,436	85,436		85,436	85,309		85,309	U
15	0602622A	Chemical, Smoke and Equipment Defeating Technology	02	3,923	3,923		3,923	4,004		4,004	U
16	0602623A	Joint Service Small Arms Program	02	5,545	5,545		5,545	5,615		5,615	U
17	0602624A	Weapons and Munitions Technology	02	53,581	53,581		53,581	41,455		41,455	U

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18	0602705A	Electronics and Electronic Devices	02	62,654	56,322	56,322					U
19	0602709A	Night Vision Technology	02	37,501	36,079	36,079					U
20	0602712A	Countermines Systems	02	35,586	26,497	26,497					U
21	0602716A	Human Factors Engineering Technology	02	23,220	23,671	23,671					U
22	0602720A	Environmental Quality Technology	02	20,270	22,151	22,151					U
23	0602782A	Command, Control, Communications Technology	02	34,749	37,803	37,803					U
24	0602783A	Computer and Software Technology	02	12,266	13,811	13,811					U
25	0602784A	Military Engineering Technology	02	80,130	67,416	67,416					U
26	0602785A	Manpower/Personnel/Training Technology	02	22,474	26,045	26,045					U
27	0602786A	Warfighter Technology	02	38,420	37,403	37,403					U
28	0602787A	Medical Technology	02	74,186	77,111	77,111					U
		Applied Research		1,070,349	907,574	907,574					
29	0603001A	Warfighter Advanced Technology	03	54,606	38,831	38,831					U
30	0603002A	Medical Advanced Technology	03	103,753	68,365	68,365					U
31	0603003A	Aviation Advanced Technology	03	99,542	94,280	94,280					U
32	0603004A	Weapons and Munitions Advanced Technology	03	95,504	68,714	68,714					U
33	0603005A	Combat Vehicle and Automotive Advanced Technology	03	136,624	122,132	122,132					U
34	0603006A	Space Application Advanced Technology	03	5,384	3,904	3,904					U

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18	0602705A	Electronics and Electronic Devices	02	56,322	56,322		56,322	58,352		58,352	U
19	0602709A	Night Vision Technology	02	36,079	36,079		36,079	34,723		34,723	U
20	0602712A	Countermines Systems	02	26,497	26,497		26,497	26,190		26,190	U
21	0602716A	Human Factors Engineering Technology	02	23,671	23,671		23,671	24,127		24,127	U
22	0602720A	Environmental Quality Technology	02	22,151	22,151		22,151	21,678		21,678	U
23	0602782A	Command, Control, Communications Technology	02	37,803	37,803		37,803	33,123		33,123	U
24	0602783A	Computer and Software Technology	02	13,811	13,811		13,811	14,041		14,041	U
25	0602784A	Military Engineering Technology	02	67,416	67,416		67,416	67,720		67,720	U
26	0602785A	Manpower/Personnel/Training Technology	02	26,045	26,045		26,045	20,216		20,216	U
27	0602786A	Warfighter Technology	02	37,403	37,403		37,403	39,559		39,559	U
28	0602787A	Medical Technology	02	77,111	77,111		77,111	83,434		83,434	U
		Applied Research		907,574	907,574		907,574	889,182		889,182	
29	0603001A	Warfighter Advanced Technology	03	38,831	38,831		38,831	44,863		44,863	U
30	0603002A	Medical Advanced Technology	03	68,365	68,365		68,365	67,780		67,780	U
31	0603003A	Aviation Advanced Technology	03	94,280	94,280		94,280	160,746		160,746	U
32	0603004A	Weapons and Munitions Advanced Technology	03	68,714	68,714		68,714	84,079		84,079	U
33	0603005A	Combat Vehicle and Automotive Advanced Technology	03	122,132	122,132		122,132	125,537		125,537	U
34	0603006A	Space Application Advanced Technology	03	3,904	3,904		3,904	12,231		12,231	U

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35	0603007A	Manpower, Personnel and Training Advanced Technology	03	11,571	14,417	14,417					U
36	0603009A	TRACTOR HIKE	03	9,002	8,074	21,374					U
37	0603015A	Next Generation Training & Simulation Systems	03	16,735	18,969	18,969					U
38	0603020A	TRACTOR ROSE	03	11,912	11,910	11,910					U
39	0603125A	Combating Terrorism - Technology Development	03	32,430	27,686	27,686					U
40	0603130A	TRACTOR NAIL	03	2,381	2,340	2,340					U
41	0603131A	TRACTOR EGGS	03	2,431	2,470	2,470					U
42	0603270A	Electronic Warfare Technology	03	31,810	27,893	27,893					U
43	0603313A	Missile and Rocket Advanced Technology	03	102,490	52,190	52,190					U
44	0603322A	TRACTOR CAGE	03	10,999	11,107	11,107					U
45	0603461A	High Performance Computing Modernization Program	03	215,138	177,190	177,190					U
46	0603606A	Landmine Warfare and Barrier Advanced Technology	03	13,425	17,451	17,451					U
47	0603607A	Joint Service Small Arms Program	03	4,903	5,839	5,839					U
48	0603710A	Night Vision Advanced Technology	03	39,329	44,468	44,468					U
49	0603728A	Environmental Quality Technology Demonstrations	03	14,533	11,137	11,137					U
50	0603734A	Military Engineering Advanced Technology	03	26,247	20,684	20,684					U

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35	0603007A	Manpower, Personnel and Training Advanced Technology	03	14,417	14,417		14,417	6,466		6,466	U
36	0603009A	TRACTOR HIKE	03	8,074	21,374		21,374	28,552		28,552	U
37	0603015A	Next Generation Training & Simulation Systems	03	18,969	18,969		18,969	16,434		16,434	U
38	0603020A	TRACTOR ROSE	03	11,910	11,910		11,910				U
39	0603125A	Combating Terrorism - Technology Development	03	27,686	27,686		27,686	26,903		26,903	U
40	0603130A	TRACTOR NAIL	03	2,340	2,340		2,340	4,880		4,880	U
41	0603131A	TRACTOR EGGS	03	2,470	2,470		2,470	4,326		4,326	U
42	0603270A	Electronic Warfare Technology	03	27,893	27,893		27,893	31,296		31,296	U
43	0603313A	Missile and Rocket Advanced Technology	03	52,190	52,190		52,190	62,850		62,850	U
44	0603322A	TRACTOR CAGE	03	11,107	11,107		11,107	12,323		12,323	U
45	0603461A	High Performance Computing Modernization Program	03	177,190	177,190		177,190	182,331		182,331	U
46	0603606A	Landmine Warfare and Barrier Advanced Technology	03	17,451	17,451		17,451	17,948		17,948	U
47	0603607A	Joint Service Small Arms Program	03	5,839	5,839		5,839	5,796		5,796	U
48	0603710A	Night Vision Advanced Technology	03	44,468	44,468		44,468	47,135		47,135	U
49	0603728A	Environmental Quality Technology Demonstrations	03	11,137	11,137		11,137	10,421		10,421	U
50	0603734A	Military Engineering Advanced Technology	03	20,684	20,684		20,684	32,448		32,448	U

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51	0603772A	Advanced Tactical Computer Science and Sensor Technology	03	36,658	44,239	44,239					U
52	0603794A	C3 Advanced Technology	03	36,339	35,775	35,775					U
		Advanced Technology Development		1,113,746	930,065	943,365					
53	0603305A	Army Missile Defense Systems Integration	04	29,270	9,433	9,433					U
54	0603308A	Army Space Systems Integration	04	29,561	23,056	23,056	9,375	9,375		9,375	U
55	0603327A	Air and Missile Defense Systems Engineering	04			14,200					U
56	0603619A	Landmine Warfare and Barrier - Adv Dev	04	40,943	72,117	72,117					U
57	0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04	12,894	28,244	28,244		16,020		16,020	U
58	0603639A	Tank and Medium Caliber Ammunition	04	42,272	40,096	42,096					U
59	0603645A	Armored System Modernization - Adv Dev	04								U
60	0603747A	Soldier Support and Survivability	04	5,035	10,506	10,506					U
61	0603766A	Tactical Electronic Surveillance System - Adv Dev	04	17,562	15,730	15,730					U
62	0603774A	Night Vision Systems Advanced Development	04	7,003	10,321	10,321					U
63	0603779A	Environmental Quality Technology - Dem/Val	04	8,464	7,785	7,785					U
64	0603790A	NATO Research and Development	04	5,835	2,300	2,300					U
65	0603801A	Aviation - Adv Dev	04		10,014	10,014					U

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51	0603772A	Advanced Tactical Computer Science and Sensor Technology	03	44,239	44,239		44,239	52,206		52,206	U
52	0603794A	C3 Advanced Technology	03	35,775	35,775		35,775	33,426		33,426	U
		Advanced Technology Development		930,065	943,365		943,365	1,070,977		1,070,977	
53	0603305A	Army Missile Defense Systems Integration	04	9,433	9,433		9,433	9,634		9,634	U
54	0603308A	Army Space Systems Integration	04	32,431	32,431		32,431				U
55	0603327A	Air and Missile Defense Systems Engineering	04		14,200		14,200	33,949	15,000	48,949	U
56	0603619A	Landmine Warfare and Barrier - Adv Dev	04	72,117	72,117		72,117	72,909		72,909	U
57	0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04	28,244	44,264		44,264	7,135		7,135	U
58	0603639A	Tank and Medium Caliber Ammunition	04	40,096	42,096		42,096	41,452		41,452	U
59	0603645A	Armored System Modernization - Adv Dev	04					32,739		32,739	U
60	0603747A	Soldier Support and Survivability	04	10,506	10,506		10,506	10,157	3,000	13,157	U
61	0603766A	Tactical Electronic Surveillance System - Adv Dev	04	15,730	15,730		15,730	27,733		27,733	U
62	0603774A	Night Vision Systems Advanced Development	04	10,321	10,321		10,321	12,347		12,347	U
63	0603779A	Environmental Quality Technology - Dem/Val	04	7,785	7,785		7,785	10,456		10,456	U
64	0603790A	NATO Research and Development	04	2,300	2,300		2,300	2,588		2,588	U
65	0603801A	Aviation - Adv Dev	04	10,014	10,014		10,014	14,055		14,055	U

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66	0603804A	Logistics and Engineer Equipment - Adv Dev	04	20,271	20,834	20,834					U
67	0603807A	Medical Systems - Adv Dev	04	39,711	33,503	33,503					U
68	0603827A	Soldier Systems - Advanced Development	04	22,251	31,120	31,120					U
69	0604017A	Robotics Development	04								U
70	0604100A	Analysis Of Alternatives	04	7,533	6,608	6,608					U
71	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04		35,132	35,132					U
72	0604115A	Technology Maturation Initiatives	04	34,493	70,047	70,047					U
73	0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04								U
74	0604118A	TRACTOR BEAM	04								U
75	0604120A	Assured Positioning, Navigation and Timing (PNT)	04	26,967	83,279	83,279					U
76	0604121A	Synthetic Training Environment Refinement & Prototyping	04								U
77	0604319A	Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	04	149,222							U
78	0305251A	Cyberspace Operations Forces and Force Support	04		40,510	40,510					U
79	1206308A	Army Space Systems Integration	04								U
		Advanced Component Development & Prototypes		499,287	550,635	566,835	9,375	25,395		25,395	
80	0604201A	Aircraft Avionics	05	18,194	83,248	83,248					U

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66	0603804A	Logistics and Engineer Equipment - Adv Dev	04	20,834	20,834		20,834	35,333		35,333	U
67	0603807A	Medical Systems - Adv Dev	04	33,503	33,503		33,503	33,491		33,491	U
68	0603827A	Soldier Systems - Advanced Development	04	31,120	31,120		31,120	20,239		20,239	U
69	0604017A	Robotics Development	04					39,608		39,608	U
70	0604100A	Analysis Of Alternatives	04	6,608	6,608		6,608	9,921		9,921	U
71	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04	35,132	35,132		35,132	76,728		76,728	U
72	0604115A	Technology Maturation Initiatives	04	70,047	70,047		70,047	115,221		115,221	U
73	0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04					20,000		20,000	U
74	0604118A	TRACTOR BEAM	04					10,400		10,400	U
75	0604120A	Assured Positioning, Navigation and Timing (PNT)	04	83,279	83,279		83,279	164,967		164,967	U
76	0604121A	Synthetic Training Environment Refinement & Prototyping	04					1,600		1,600	U
77	0604319A	Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	04					11,303		11,303	U
78	0305251A	Cyberspace Operations Forces and Force Support	04	40,510	40,510		40,510	56,492		56,492	U
79	1206308A	Army Space Systems Integration	04					20,432		20,432	U
		Advanced Component Development & Prototypes		560,010	592,230		592,230	890,889	18,000	908,889	
80	0604201A	Aircraft Avionics	05	83,248	83,248		83,248	30,153		30,153	U

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81	0604270A	Electronic Warfare Development	05	20,586	34,642	37,242					U
82	0604280A	Joint Tactical Radio	05	4,415							U
83	0604290A	Mid-tier Networking Vehicular Radio (MNVR)	05	8,416	12,172	12,172					U
84	0604321A	All Source Analysis System	05	4,309	3,958	3,958					U
85	0604328A	TRACTOR CAGE	05	15,138	12,525	12,525					U
86	0604601A	Infantry Support Weapons	05	86,966	66,943	66,943					U
87	0604604A	Medium Tactical Vehicles	05								U
88	0604611A	JAVELIN	05	3,789	20,011	20,011					U
89	0604622A	Family of Heavy Tactical Vehicles	05		11,429	11,429					U
90	0604633A	Air Traffic Control	05	9,714	3,421	3,421					U
91	0604641A	Tactical Unmanned Ground Vehicle (TUGV)	05	13,599	39,282	39,282					U
92	0604642A	Light Tactical Wheeled Vehicles	05		494	494					U
93	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05		9,678	9,678					U
94	0604710A	Night Vision Systems - Eng Dev	05	65,482	84,519	84,519					U
95	0604713A	Combat Feeding, Clothing, and Equipment	05	1,694	2,054	2,054					U
96	0604715A	Non-System Training Devices - Eng Dev	05	26,768	30,774	35,774	33	33		33	U
97	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	33,619	53,332	61,532		143,900	-78,700	65,200	U

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81	0604270A	Electronic Warfare Development	05	34,642	37,242		37,242	71,671		71,671	U
82	0604280A	Joint Tactical Radio	05								U
83	0604290A	Mid-tier Networking Vehicular Radio (MNVR)	05	12,172	12,172		12,172	10,589		10,589	U
84	0604321A	All Source Analysis System	05	3,958	3,958		3,958	4,774		4,774	U
85	0604328A	TRACTOR CAGE	05	12,525	12,525		12,525	17,252		17,252	U
86	0604601A	Infantry Support Weapons	05	66,943	66,943		66,943	87,643		87,643	U
87	0604604A	Medium Tactical Vehicles	05					6,039		6,039	U
88	0604611A	JAVELIN	05	20,011	20,011		20,011	21,095		21,095	U
89	0604622A	Family of Heavy Tactical Vehicles	05	11,429	11,429		11,429	10,507		10,507	U
90	0604633A	Air Traffic Control	05	3,421	3,421		3,421	3,536		3,536	U
91	0604641A	Tactical Unmanned Ground Vehicle (TUGV)	05	39,282	39,282		39,282				U
92	0604642A	Light Tactical Wheeled Vehicles	05	494	494		494	7,000		7,000	U
93	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05	9,678	9,678		9,678	36,242		36,242	U
94	0604710A	Night Vision Systems - Eng Dev	05	84,519	84,519		84,519	108,504		108,504	U
95	0604713A	Combat Feeding, Clothing, and Equipment	05	2,054	2,054		2,054	3,702		3,702	U
96	0604715A	Non-System Training Devices - Eng Dev	05	30,807	35,807		35,807	43,575		43,575	U
97	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	132,032	205,432	-78,700	126,732	28,726		28,726	U

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98	0604742A	Constructive Simulation Systems Development	05	22,609	17,887	17,887					U
99	0604746A	Automatic Test Equipment Development	05	8,636	8,813	8,813					U
100	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05	8,843	10,487	10,487					U
101	0604768A	Brilliant Anti-Armor Submunition (BAT)	05								U
102	0604780A	Combined Arms Tactical Trainer (CATT) Core	05	20,808	15,068	15,068					U
103	0604798A	Brigade Analysis, Integration and Evaluation	05	96,286	89,716	146,655					U
104	0604802A	Weapons and Munitions - Eng Dev	05	18,037	80,365	99,165					U
105	0604804A	Logistics and Engineer Equipment - Eng Dev	05	43,229	75,098	75,098					U
106	0604805A	Command, Control, Communications Systems - Eng Dev	05	2,780	4,245	4,245					U
107	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05	39,295	41,124	41,124					U
108	0604808A	Landmine Warfare/Barrier - Eng Dev	05	63,028	39,630	39,630					U
109	0604818A	Army Tactical Command & Control Hardware & Software	05	125,107	205,590	205,590					U
110	0604820A	Radar Development	05	11,821	15,983	15,983					U
111	0604822A	General Fund Enterprise Business System (GFEBs)	05	20,533	6,805	6,805					U
112	0604823A	Firefinder	05	2,850	9,235	9,235					U

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98	0604742A	Constructive Simulation Systems Development	05	17,887	17,887		17,887	18,562		18,562	U
99	0604746A	Automatic Test Equipment Development	05	8,813	8,813		8,813	8,344		8,344	U
100	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05	10,487	10,487		10,487	11,270		11,270	U
101	0604768A	Brilliant Anti-Armor Submunition (BAT)	05					10,000		10,000	U
102	0604780A	Combined Arms Tactical Trainer (CATT) Core	05	15,068	15,068		15,068	18,566		18,566	U
103	0604798A	Brigade Analysis, Integration and Evaluation	05	89,716	146,655		146,655	145,360		145,360	U
104	0604802A	Weapons and Munitions - Eng Dev	05	80,365	99,165		99,165	145,232		145,232	U
105	0604804A	Logistics and Engineer Equipment - Eng Dev	05	75,098	75,098		75,098	90,965		90,965	U
106	0604805A	Command, Control, Communications Systems - Eng Dev	05	4,245	4,245		4,245	9,910		9,910	U
107	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05	41,124	41,124		41,124	39,238		39,238	U
108	0604808A	Landmine Warfare/Barrier - Eng Dev	05	39,630	39,630		39,630	34,684		34,684	U
109	0604818A	Army Tactical Command & Control Hardware & Software	05	205,590	205,590		205,590	164,409		164,409	U
110	0604820A	Radar Development	05	15,983	15,983		15,983	32,968		32,968	U
111	0604822A	General Fund Enterprise Business System (GFEBs)	05	6,805	6,805		6,805	49,554		49,554	U
112	0604823A	Firefinder	05	9,235	9,235		9,235	45,605		45,605	U

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113	0604827A	Soldier Systems - Warrior Dem/Val	05	15,694	12,393	12,393					U
114	0604852A	Suite of Survivability Enhancement Systems - EMD	05								U
115	0604854A	Artillery Systems - EMD	05	2,251	1,756	4,506					U
116	0605013A	Information Technology Development	05	48,028	74,236	74,236					U
117	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05	116,215	155,584	155,584					U
118	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05	213,034	184,221	184,221					U
119	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05		4,980	4,980					U
120	0605030A	Joint Tactical Network Center (JTNC)	05	12,834	15,041	15,041					U
121	0605031A	Joint Tactical Network (JTN)	05	20,790	16,014	16,014					U
122	0605032A	TRACTOR TIRE	05	10,677	27,254	27,254		10,000		10,000	U
123	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05		5,032	5,032					U
124	0605034A	Tactical Security System (TSS)	05		2,904	2,904					U
125	0605035A	Common Infrared Countermeasures (CIRCM)	05	98,496	96,977	96,977	10,900	10,900		10,900	U
126	0605036A	Combating Weapons of Mass Destruction (CWMD)	05		2,089	2,089					U
127	0605037A	Evidence Collection and Detainee Processing	05								U

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113	0604827A	Soldier Systems - Warrior Dem/Val	05	12,393	12,393		12,393	16,127		16,127	U
114	0604852A	Suite of Survivability Enhancement Systems - EMD	05					98,600		98,600	U
115	0604854A	Artillery Systems - EMD	05	1,756	4,506		4,506	1,972		1,972	U
116	0605013A	Information Technology Development	05	74,236	74,236		74,236	81,776		81,776	U
117	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05	155,584	155,584		155,584	172,361		172,361	U
118	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05	184,221	184,221		184,221	199,778		199,778	U
119	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05	4,980	4,980		4,980	4,418		4,418	U
120	0605030A	Joint Tactical Network Center (JTNC)	05	15,041	15,041		15,041	15,877		15,877	U
121	0605031A	Joint Tactical Network (JTN)	05	16,014	16,014		16,014	44,150		44,150	U
122	0605032A	TRACTOR TIRE	05	27,254	37,254		37,254	34,670	5,000	39,670	U
123	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05	5,032	5,032		5,032	5,207		5,207	U
124	0605034A	Tactical Security System (TSS)	05	2,904	2,904		2,904	4,727		4,727	U
125	0605035A	Common Infrared Countermeasures (CIRCM)	05	107,877	107,877		107,877	105,778	21,540	127,318	U
126	0605036A	Combating Weapons of Mass Destruction (CWMD)	05	2,089	2,089		2,089	6,927		6,927	U
127	0605037A	Evidence Collection and Detainee Processing	05					214		214	U

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128	0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite	05								U
129	0605041A	Defensive CYBER Tool Development	05		33,836	33,836		50,500		50,500	U
130	0605042A	Tactical Network Radio Systems (Low-Tier)	05		18,824	18,824					U
131	0605047A	Contract Writing System	05		20,663	20,663					U
132	0605049A	Missile Warning System Modernization (MWSM)	05								U
133	0605051A	Aircraft Survivability Development	05	77,395	41,133	51,133	73,110	73,110		73,110	U
134	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05		83,995	83,995					U
135	0605053A	Ground Robotics	05								U
136	0605350A	WIN-T Increment 3 - Full Networking	05	32,187							U
137	0605380A	AMF Joint Tactical Radio System (JTRS)	05	10,143	5,028	5,028					U
138	0605450A	Joint Air-to-Ground Missile (JAGM)	05	79,897	42,972	42,972					U
139	0605456A	PAC-3/MSE Missile	05	2,201							U
140	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05	222,074	252,811	272,811					U
141	0605625A	Manned Ground Vehicle	05	37,692							U
142	0605626A	Aerial Common Sensor	05	2							U
143	0605766A	National Capabilities Integration (MIP)	05	10,599	4,955	4,955					U

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128	0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite	05					16,125		16,125	U
129	0605041A	Defensive CYBER Tool Development	05	33,836	84,336		84,336	55,165		55,165	U
130	0605042A	Tactical Network Radio Systems (Low-Tier)	05	18,824	18,824		18,824	20,076		20,076	U
131	0605047A	Contract Writing System	05	20,663	20,663		20,663	20,322		20,322	U
132	0605049A	Missile Warning System Modernization (MWSM)	05					55,810		55,810	U
133	0605051A	Aircraft Survivability Development	05	114,243	124,243		124,243	30,879	30,100	60,979	U
134	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05	83,995	83,995		83,995	175,069		175,069	U
135	0605053A	Ground Robotics	05					70,760		70,760	U
136	0605350A	WIN-T Increment 3 - Full Networking	05								U
137	0605380A	AMF Joint Tactical Radio System (JTRS)	05	5,028	5,028		5,028	8,965		8,965	U
138	0605450A	Joint Air-to-Ground Missile (JAGM)	05	42,972	42,972		42,972	34,626		34,626	U
139	0605456A	PAC-3/MSE Missile	05								U
140	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05	252,811	272,811		272,811	336,420		336,420	U
141	0605625A	Manned Ground Vehicle	05								U
142	0605626A	Aerial Common Sensor	05								U
143	0605766A	National Capabilities Integration (MIP)	05	4,955	4,955		4,955	6,882		6,882	U

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144	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	31,197	11,530	11,530					U
145	0605830A	Aviation Ground Support Equipment	05	13,528	2,142	2,142					U
146	0210609A	Paladin Integrated Management (PIM)	05	136,353	41,498	41,498					U
147	0303032A	TROJAN - RH12	05	5,022	4,273	4,273					U
148	0303267A	Auctioned Spectrum Relocation Fund	05	71,823							U
149	0303367A	Spectrum Access Research and Development	05	125,283							U
150	0304270A	Electronic Warfare Development	05	12,686	14,425	18,425					U
151	1205117A	Tractor Bears	05								U
		System Development & Demonstration		2,202,652	2,265,094	2,393,383	84,043	288,443	-78,700	209,743	
152	0604256A	Threat Simulator Development	06	27,157	25,675	25,675					U
153	0604258A	Target Systems Development	06	16,163	19,122	19,122					U
154	0604759A	Major T&E Investment	06	65,059	84,777	84,777					U
155	0605103A	Rand Arroyo Center	06	20,014	20,658	20,658					U
156	0605301A	Army Kwajalein Atoll	06	200,393	236,648	236,648					U
157	0605326A	Concepts Experimentation Program	06	18,705	25,596	25,596					U
158	0605502A	Small Business Innovative Research	06	220,833							U
159	0605601A	Army Test Ranges and Facilities	06	273,275	293,748	307,882					U
160	0605602A	Army Technical Test Instrumentation and Targets	06	52,254	52,404	64,127					U

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144	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	11,530	11,530		11,530	23,467		23,467	U
145	0605830A	Aviation Ground Support Equipment	05	2,142	2,142		2,142	6,930		6,930	U
146	0210609A	Paladin Integrated Management (PIM)	05	41,498	41,498		41,498	6,112		6,112	U
147	0303032A	TROJAN - RH12	05	4,273	4,273		4,273	4,431	1,200	5,631	U
148	0303267A	Auctioned Spectrum Relocation Fund	05								U
149	0303367A	Spectrum Access Research and Development	05								U
150	0304270A	Electronic Warfare Development	05	14,425	18,425		18,425	14,616		14,616	U
151	1205117A	Tractor Bears	05					17,928		17,928	U
		System Development & Demonstration		2,427,837	2,681,826	-78,700	2,603,126	3,012,840	57,840	3,070,680	
152	0604256A	Threat Simulator Development	06	25,675	25,675		25,675	22,862		22,862	U
153	0604258A	Target Systems Development	06	19,122	19,122		19,122	13,902		13,902	U
154	0604759A	Major T&E Investment	06	84,777	84,777		84,777	102,901		102,901	U
155	0605103A	Rand Arroyo Center	06	20,658	20,658		20,658	20,140		20,140	U
156	0605301A	Army Kwajalein Atoll	06	236,648	236,648		236,648	246,663		246,663	U
157	0605326A	Concepts Experimentation Program	06	25,596	25,596		25,596	29,820		29,820	U
158	0605502A	Small Business Innovative Research	06								U
159	0605601A	Army Test Ranges and Facilities	06	293,748	307,882		307,882	307,588		307,588	U
160	0605602A	Army Technical Test Instrumentation and Targets	06	52,404	64,127		64,127	49,242		49,242	U

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161	0605604A	Survivability/Lethality Analysis	06	33,069	38,571	38,571					U
162	0605606A	Aircraft Certification	06	4,571	4,665	4,665					U
163	0605702A	Meteorological Support to RDT&E Activities	06	8,104	6,925	6,925					U
164	0605706A	Materiel Systems Analysis	06	20,203	21,677	21,677					U
165	0605709A	Exploitation of Foreign Items	06	10,396	12,415	12,415					U
166	0605712A	Support of Operational Testing	06	49,128	49,684	49,684					U
167	0605716A	Army Evaluation Center	06	52,265	55,905	55,905					U
168	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06	901	7,959	7,959					U
169	0605801A	Programwide Activities	06	61,060	51,822	51,822					U
170	0605803A	Technical Information Activities	06	25,991	33,323	33,323					U
171	0605805A	Munitions Standardization, Effectiveness and Safety	06	48,335	40,545	40,545					U
172	0605857A	Environmental Quality Technology Mgmt Support	06	3,673	2,130	2,130					U
173	0605898A	Army Direct Report Headquarters - R&D - MHA	06	48,312	49,885	49,885					U
174	0606001A	Military Ground-Based CREW Technology	06								U
175	0606002A	Ronald Reagan Ballistic Missile Defense Test Site	06								U
176	0303260A	Defense Military Deception Initiative	06		2,000	2,000					U

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161	0605604A	Survivability/Lethality Analysis	06	38,571	38,571		38,571	41,843		41,843	U
162	0605606A	Aircraft Certification	06	4,665	4,665		4,665	4,804		4,804	U
163	0605702A	Meteorological Support to RDT&E Activities	06	6,925	6,925		6,925	7,238		7,238	U
164	0605706A	Materiel Systems Analysis	06	21,677	21,677		21,677	21,890		21,890	U
165	0605709A	Exploitation of Foreign Items	06	12,415	12,415		12,415	12,684		12,684	U
166	0605712A	Support of Operational Testing	06	49,684	49,684		49,684	51,040		51,040	U
167	0605716A	Army Evaluation Center	06	55,905	55,905		55,905	56,246		56,246	U
168	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06	7,959	7,959		7,959	1,829		1,829	U
169	0605801A	Programwide Activities	06	51,822	51,822		51,822	55,060		55,060	U
170	0605803A	Technical Information Activities	06	33,323	33,323		33,323	33,934		33,934	U
171	0605805A	Munitions Standardization, Effectiveness and Safety	06	40,545	40,545		40,545	43,444		43,444	U
172	0605857A	Environmental Quality Technology Mgmt Support	06	2,130	2,130		2,130	5,087		5,087	U
173	0605898A	Army Direct Report Headquarters - R&D - MHA	06	49,885	49,885		49,885	54,679		54,679	U
174	0606001A	Military Ground-Based CREW Technology	06					7,916		7,916	U
175	0606002A	Ronald Reagan Ballistic Missile Defense Test Site	06					61,254		61,254	U
176	0303260A	Defense Military Deception Initiative	06	2,000	2,000		2,000	1,779		1,779	U

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177	0909999A	Financing for Cancelled Account Adjustments	06	65							U
		RDT&E Management Support		1,259,926	1,136,134	1,161,991					
178	0603778A	MLRS Product Improvement Program	07	21,202	9,663	34,763					U
179	0603813A	TRACTOR PULL	07	9,461	3,960	3,960					U
180	0605024A	Anti-Tamper Technology Support	07		3,638	3,638					U
181	0607131A	Weapons and Munitions Product Improvement Programs	07	5,678	14,517	14,517		5,100		5,100	U
182	0607133A	TRACTOR SMOKE	07	7,569	4,479	4,479					U
183	0607134A	Long Range Precision Fires (LRPF)	07		39,275	67,006					U
184	0607135A	Apache Product Improvement Program	07	62,964	66,441	66,441					U
185	0607136A	Blackhawk Product Improvement Program	07	64,011	46,765	46,765					U
186	0607137A	Chinook Product Improvement Program	07	31,122	91,848	91,848					U
187	0607138A	Fixed Wing Product Improvement Program	07	1,105	796	796					U
188	0607139A	Improved Turbine Engine Program	07	49,137	126,105	126,105					U
189	0607140A	Emerging Technologies from NIE	07	2,383	2,369	2,369					U
190	0607141A	Logistics Automation	07	1,318	4,563	4,563					U
191	0607142A	Aviation Rocket System Product Improvement and Development	07			8,000					U
192	0607143A	Unmanned Aircraft System Universal Products	07								U

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177	0909999A	Financing for Cancelled Account Adjustments	06								U
		RDT&E Management Support		1,136,134	1,161,991		1,161,991	1,253,845		1,253,845	
178	0603778A	MLRS Product Improvement Program	07	9,663	34,763		34,763	8,929		8,929	U
179	0603813A	TRACTOR PULL	07	3,960	3,960		3,960	4,014		4,014	U
180	0605024A	Anti-Tamper Technology Support	07	3,638	3,638		3,638	4,094		4,094	U
181	0607131A	Weapons and Munitions Product Improvement Programs	07	14,517	19,617		19,617	15,738		15,738	U
182	0607133A	TRACTOR SMOKE	07	4,479	4,479		4,479	4,513		4,513	U
183	0607134A	Long Range Precision Fires (LRPF)	07	39,275	67,006		67,006	102,014		102,014	U
184	0607135A	Apache Product Improvement Program	07	66,441	66,441		66,441	59,977		59,977	U
185	0607136A	Blackhawk Product Improvement Program	07	46,765	46,765		46,765	34,416		34,416	U
186	0607137A	Chinook Product Improvement Program	07	91,848	91,848		91,848	194,567		194,567	U
187	0607138A	Fixed Wing Product Improvement Program	07	796	796		796	9,981		9,981	U
188	0607139A	Improved Turbine Engine Program	07	126,105	126,105		126,105	204,304		204,304	U
189	0607140A	Emerging Technologies from NIE	07	2,369	2,369		2,369	1,023		1,023	U
190	0607141A	Logistics Automation	07	4,563	4,563		4,563	1,504		1,504	U
191	0607142A	Aviation Rocket System Product Improvement and Development	07		8,000		8,000	10,064		10,064	U
192	0607143A	Unmanned Aircraft System Universal Products	07					38,463		38,463	U

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193	0607665A	Family of Biometrics	07	7,179	12,098	12,098					U
194	0607865A	Patriot Product Improvement	07	87,537	49,482	49,482					U
195	0202429A	Aerostat Joint Project - COCOM Exercise	07	10,171	45,482	45,482					U
196	0203728A	Joint Automated Deep Operation Coordination System (JADOCS)	07	30,669	30,455	30,455					U
197	0203735A	Combat Vehicle Improvement Programs	07	382,176	316,857	327,357					U
198	0203740A	Maneuver Control System	07	14,864	4,031	4,031					U
199	0203743A	155mm Self-Propelled Howitzer Improvements	07								U
200	0203744A	Aircraft Modifications/Product Improvement Programs	07		35,793	35,793					U
201	0203752A	Aircraft Engine Component Improvement Program	07	349	259	259					U
202	0203758A	Digitization	07	4,188	6,483	6,483					U
203	0203801A	Missile/Air Defense Product Improvement Program	07	3,029	5,122	53,722					U
204	0203802A	Other Missile Product Improvement Programs	07	49,191	7,491	7,491		1,080		1,080	U
205	0203808A	TRACTOR CARD	07	34,686	20,333	20,333					U
206	0205402A	Integrated Base Defense - Operational System Dev	07	10,324				3,450		3,450	U
207	0205410A	Materials Handling Equipment	07	386	124	124					U
208	0205412A	Environmental Quality Technology - Operational System Dev	07								U

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193	0607665A	Family of Biometrics	07 12,098	12,098		12,098	6,159		6,159	U
194	0607865A	Patriot Product Improvement	07 49,482	49,482		49,482	90,217		90,217	U
195	0202429A	Aerostat Joint Project - COCOM Exercise	07 45,482	45,482		45,482	6,749		6,749	U
196	0203728A	Joint Automated Deep Operation Coordination System (JADOCS)	07 30,455	30,455		30,455	33,520		33,520	U
197	0203735A	Combat Vehicle Improvement Programs	07 316,857	327,357		327,357	343,175		343,175	U
198	0203740A	Maneuver Control System	07 4,031	4,031		4,031	6,639		6,639	U
199	0203743A	155mm Self-Propelled Howitzer Improvements	07				40,784		40,784	U
200	0203744A	Aircraft Modifications/Product Improvement Programs	07 35,793	35,793		35,793	39,358		39,358	U
201	0203752A	Aircraft Engine Component Improvement Program	07 259	259		259	145		145	U
202	0203758A	Digitization	07 6,483	6,483		6,483	4,803		4,803	U
203	0203801A	Missile/Air Defense Product Improvement Program	07 5,122	53,722		53,722	2,723	15,000	17,723	U
204	0203802A	Other Missile Product Improvement Programs	07 7,491	8,571		8,571	5,000		5,000	U
205	0203808A	TRACTOR CARD	07 20,333	20,333		20,333	37,883		37,883	U
206	0205402A	Integrated Base Defense - Operational System Dev	07	3,450		3,450				U
207	0205410A	Materials Handling Equipment	07 124	124		124	1,582		1,582	U
208	0205412A	Environmental Quality Technology - Operational System Dev	07				195		195	U

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209	0205456A	Lower Tier Air and Missile Defense (AMD) System	07	61,653	69,417	73,417					U
210	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	36,032	22,044	38,044					U
211	0208053A	Joint Tactical Ground System	07	28,015	12,649	12,649					U
213	0303028A	Security and Intelligence Activities	07	13,156	11,619	11,619					U
214	0303140A	Information Systems Security Program	07	31,032	38,280	38,280					U
215	0303141A	Global Combat Support System	07	25,304	27,223	28,667					U
216	0303142A	SATCOM Ground Environment (SPACE)	07	9,045	18,815	18,815					U
217	0303150A	WWMCCS/Global Command and Control System	07	6,810	4,718	4,718					U
219	0305127A	Foreign Counterintelligence Activities	07			4,100					U
220	0305172A	Combined Advanced Applications	07								U
221	0305179A	Integrated Broadcast Service (IBS)	07	750							U
222	0305204A	Tactical Unmanned Aerial Vehicles	07	15,370	8,218	8,218					U
223	0305206A	Airborne Reconnaissance Systems	07	20,725	11,799	11,799					U
224	0305208A	Distributed Common Ground/Surface Systems	07	25,592	32,284	32,284					U
225	0305219A	MQ-1C Gray Eagle UAS	07	22,285	13,470	30,970					U
226	0305232A	RQ-11 UAV	07		1,613	1,613					U
227	0305233A	RQ-7 UAV	07	11,797	4,597	7,597					U
228	0307665A	Biometrics Enabled Intelligence	07				7,104	8,854		8,854	U

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209	0205456A	Lower Tier Air and Missile Defense (AMD) System	07	69,417	73,417		73,417	78,926		78,926	U
210	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	22,044	38,044		38,044	102,807		102,807	U
211	0208053A	Joint Tactical Ground System	07	12,649	12,649		12,649				U
213	0303028A	Security and Intelligence Activities	07	11,619	11,619		11,619	13,807		13,807	U
214	0303140A	Information Systems Security Program	07	38,280	38,280		38,280	132,438		132,438	U
215	0303141A	Global Combat Support System	07	27,223	28,667		28,667	64,370		64,370	U
216	0303142A	SATCOM Ground Environment (SPACE)	07	18,815	18,815		18,815				U
217	0303150A	WWMCCS/Global Command and Control System	07	4,718	4,718		4,718	10,475		10,475	U
219	0305127A	Foreign Counterintelligence Activities	07		4,100		4,100				U
220	0305172A	Combined Advanced Applications	07					1,100		1,100	U
221	0305179A	Integrated Broadcast Service (IBS)	07								U
222	0305204A	Tactical Unmanned Aerial Vehicles	07	8,218	8,218		8,218	9,433	7,492	16,925	U
223	0305206A	Airborne Reconnaissance Systems	07	11,799	11,799		11,799	5,080	15,000	20,080	U
224	0305208A	Distributed Common Ground/Surface Systems	07	32,284	32,284		32,284	24,700		24,700	U
225	0305219A	MQ-1C Gray Eagle UAS	07	13,470	30,970		30,970	9,574		9,574	U
226	0305232A	RQ-11 UAV	07	1,613	1,613		1,613	2,191		2,191	U
227	0305233A	RQ-7 UAV	07	4,597	7,597		7,597	12,773		12,773	U
228	0307665A	Biometrics Enabled Intelligence	07	7,104	8,854		8,854	2,537	6,036	8,573	U

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Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	S e c
229	0310349A	Win-T Increment 2 - Initial Networking	07	3,649	4,867	4,867					U
230	0708045A	End Item Industrial Preparedness Activities	07	58,503	62,287	62,287					U
231	1203142A	SATCOM Ground Environment (SPACE)	07								U
232	1208053A	Joint Tactical Ground System	07								U
9999	9999999999	Classified Programs		4,536	4,625	4,625					U
		Operational Systems Development		1,264,953	1,296,954	1,462,929	7,104	18,484		18,484	
233	0901560A	Continuing Resolution Programs	20		32,395	32,395	-99,022	-99,022		-99,022	U
		Undistributed			32,395	32,395	-99,022	-99,022		-99,022	
Total Research, Development, Test & Eval, Army				7,861,744	7,547,794	7,897,415	1,500	233,300	-78,700	154,600	

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Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Se
229	0310349A	Win-T Increment 2 - Initial Networking	07	4,867	4,867		4,867	4,723		4,723	U
230	0708045A	End Item Industrial Preparedness Activities	07	62,287	62,287		62,287	60,877		60,877	U
231	1203142A	SATCOM Ground Environment (SPACE)	07					11,959		11,959	U
232	1208053A	Joint Tactical Ground System	07					10,228		10,228	U
9999	9999999999	Classified Programs		4,625	4,625		4,625	7,154		7,154	U
		Operational Systems Development		1,304,058	1,481,413		1,481,413	1,877,685	43,528	1,921,213	
233	0901560A	Continuing Resolution Programs	20	-66,627	-66,627		-66,627				U
		Undistributed		-66,627	-66,627		-66,627				
Total Research, Development, Test & Eval, Army				7,627,994	8,130,715	-78,700	8,052,015	9,425,440	119,368	9,544,808	

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Synthetic Training Environment Refine & Prototype	0604121A	76	04.....	320
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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603305A / <i>Army Missile Defense Systems Integration</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	29.270	9.433	9.634	-	9.634	11.046	12.301	12.400	12.925	Continuing	Continuing
TR5: <i>Missile Defense Battlelab</i>	-	29.270	9.433	9.634	-	9.634	11.046	12.301	12.400	12.925	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element funds missile defense systems integration efforts for both the US Army Space and Missile Defense Command/Army Forces Strategic Command (USASMDC/ARSTRAT).

USASMDC/ARSTRAT: Headquarters, Department of the Army General Order 37, dated 16 October 2006, designated USASMDC/ARSTRAT as the Army proponent for space and ground-based midcourse defense (GMD), the Army integrator for global missile defense, and the Army Service Component Command (ASCC) of the U.S. Strategic Command (USSTRATCOM). Army Regulation (AR) 10-87 Army Commands, Army Service Component Commands, and Direct Reporting Units, dated 4 September 2007 and AR 5-22 The Army Force Modernization Proponent System dated 19 August 2009 designates USASMDC/ARSTRAT as the Army specified proponent for Global Missile Defense and Space/High Altitude capabilities. As the Army proponent for space, high altitude and GMD, USASMDC/ARSTRAT is responsible for developing warfighting concepts, conduct warfighting experiments to validate those concepts, identify capabilities needed to implement the validated concepts, and develop Doctrine, Organizations, Training, Material, Leadership & Education, Personnel, Facilities and Policy (DOTMLPF-P) solutions to realize the GMD capabilities. As the Army integrator for global missile defense, USASMDC/ARSTRAT is responsible for reviewing programs managed by the Army, other Services, Defense agencies and National agencies to ensure that they are correctly synchronized and will ultimately provide the capabilities required by USSTRATCOM to execute its global missile defense responsibilities.

Project TR5 funds United States Army Space and Missile Defense Command/ Army Strategic Command (USASMDC/ARSTRAT) efforts to develop the associated operational prototyping, experimentation, operational analysis, and modeling and simulation in support of current and future Forces.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	29.347	9.433	9.491	-	9.491
Current President's Budget	29.270	9.433	9.634	-	9.634
Total Adjustments	-0.077	0.000	0.143	-	0.143
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.077	-			
• Adjustments to Budget Years	0.000	0.000	0.143	-	0.143

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603305A / <i>Army Missile Defense Systems Integration</i>
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Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: TR5: *Missile Defense Battlelab*

Congressional Add: *Thermal Management Systems Prototypes*

Congressional Add Subtotals for Project: TR5

Congressional Add Totals for all Projects

	FY 2016	FY 2017
	19.000	-
	19.000	-
	19.000	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration				Project (Number/Name) TR5 / Missile Defense Battlelab			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
TR5: <i>Missile Defense Battlelab</i>	-	29.270	9.433	9.634	-	9.634	11.046	12.301	12.400	12.925	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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USASMDC/ARSTRAT: Headquarters, Department of the Army General Order 37, dated 16 October 2006, designated USASMDC/ARSTRAT as the Army proponent for space and ground-based midcourse defense (GMD), the Army integrator for global missile defense, and the Army Service Component Command (ASCC) of the U.S. Strategic Command (USSTRATCOM). Army Regulation (AR) 10-87 Army Commands, Army Service Component Commands, and Direct Reporting Units, dated 4 September 2007 and AR 5-22 The Army Force Modernization Proponent System dated 19 August 2009 designates USASMDC/ARSTRAT as the Army specified proponent for Global Missile Defense and Space/High Altitude capabilities. As the Army proponent for space, high altitude and GMD, USASMDC/ARSTRAT is responsible for developing warfighting concepts, conduct warfighting experiments to validate those concepts, identify capabilities needed to implement the validated concepts, and develop Doctrine, Organizations, Training, Material, Leadership & Education, Personnel, Facilities and Policy (DOTMLPF-P) solutions to realize the GMD capabilities. As the Army integrator for global missile defense, USASMDC/ARSTRAT is responsible for reviewing programs managed by the Army, other Services, Defense agencies and National agencies to ensure that they are correctly synchronized and will ultimately provide the capabilities required by USSTRATCOM to execute its global missile defense responsibilities.

Project TR5 funds United States Army Space and Missile Defense Command/ Army Strategic Command (USASMDC/ARSTRAT) efforts to develop the associated operational prototyping, experimentation, operational analysis, and modeling and simulation in support of current and future Forces.

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

	FY 2016	FY 2017	FY 2018
Title: Prototypes	6.160	5.635	5.776
Description: Funding is provided for the following efforts			
FY 2016 Accomplishments:			
Take the lessons learned from the FY15 efforts to continue to evaluate new technologies in realistic operating environments. This is accomplished by participating in and providing support to Unified Quest wargames and experiments to analyze and integrate technology to identify the feasibility integration into Army space, missile defense, and high altitude systems. The Space and Missile Defense Command will participate and support biennial rewrites of Army Capstone, Operational and Functional Concepts. Continue to provide operational manager support to STRATCOM, NORTHCOM and SOCOM Joint Technical Capability Demonstrations to ensure Army space, missile defense, and high altitude equities are represented in advanced technology			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / <i>Army Missile Defense Systems Integration</i>	Project (Number/Name) TR5 / <i>Missile Defense Battlelab</i>

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

	FY 2016	FY 2017	FY 2018
<p>developments by demonstrating military utility when applied to military equipment and techniques. Examples include: supporting multi service experiments and capability development of the national-directed Phased Adaptive Approach (PAA) for Ballistic Missile Defense (BMD) as it is applied to each of the regional COCOMs; and experimenting with operationally responsive space, space control, and high altitude capabilities to ensure the broader Army enterprises can leverage the advantages of these platforms for communications, Intelligence Surveillance and Reconnaissance (ISR), position navigation, missile warning and command and control. Continue to develop mitigation strategies for Army forces to operate effectively in contested space, missile defense and cyber environments. Developing effective Integrated Missile Defense concepts for Army support to the Phased Adaptive Approach (PAA) being implemented within each regional COCOM. Will support TRADOC proponents with their responsibilities relative to doctrine, organization, training, material, leader development and education, personnel, and facilities (DOTMLPF) plus related matters to continue leveraging space, missile defense, and high altitude proponent input to Joint Capabilities Integration and Development System, Science and Technology, Concept Development, Capability Development for Rapid Transition, and Capability Gap Analysis Army We will sustain our core prototyping platforms, as outlined above. Provided DOTMLPF integration for the Ground Based Midcourse Defense mission to NORTHCOM by coordinating support to the 100th MD Brigade and to the five Forward Based Mode Radar Sites deployed around the world to ensure the forces are capable of performing missions as directed by the combatant commanders. Develop/defend Army requirements development / documentation to MDA spiral/block development.</p> <p>FY 2017 Plans: Take the lessons learned from the FY16 efforts to continue to evaluate new technologies in realistic operating environments. This is accomplished by participating in and providing support to Unified Quest wargames and experiments to analyze and integrate technology to identify the feasibility integration into Army space, missile defense, and high altitude systems. The Space and Missile Defense Command will participate and support biennial rewrites of Army Capstone, Operational and Functional Concepts. Continue to provide operational manager support to STRATCOM, NORTHCOM and SOCOM Joint Technical Capability Demonstrations to ensure Army space, missile defense, and high altitude equities are represented in advanced technology developments by demonstrating military utility when applied to military equipment and techniques. Examples include: supporting multi service experiments and capability development of the national-directed Phased Adaptive Approach (PAA) for Ballistic Missile Defense (BMD) as it is applied to each of the regional COCOMs; and experimenting with operationally responsive space, space control, and high altitude capabilities to ensure the broader Army enterprises can leverage the advantages of these platforms for communications, Intelligence Surveillance and Reconnaissance (ISR), position navigation, missile warning and command and control. Continue to develop mitigation strategies for Army forces to operate effectively in contested space, missile defense and cyber environments. Developing effective Integrated Missile Defense concepts for Army support to the Phased Adaptive Approach (PAA) being implemented within each regional COCOM. Will support TRADOC proponents with their responsibilities relative to doctrine, organization, training, material, leader development and education, personnel, and facilities plus related matters to continue leveraging space, missile defense, and high altitude proponent input to Joint Capabilities</p>			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Integration and Development System, Science and Technology, Concept Development, Capability Development for Rapid Transition, and Capability Gap Analysis Army We will sustain our core prototyping platforms, as outlined above. Battlespace Command and Control Center (BC3) will be upgraded to more realistically address information flows related to Close Air Support. Support MDA to Army BMDS element transition and transfer efforts including BMDS sensor deployments. Develop/defend Army requirements development / documentation to MDA spiral/block development.</p> <p>FY 2018 Plans: "Take the lessons learned from the FY16 efforts to continue to evaluate new technologies in realistic operating environments. This is accomplished by participating in and providing support to Unified Quest wargames and experiments to analyze and integrate technology to identify the feasibility integration into Army space, missile defense, and high altitude systems. The Space and Missile Defense Command will participate and support biennial rewrites of Army Capstone, Operational and Functional Concepts. Continue to provide operational manager support to STRATCOM, NORTHCOM and SOCOM Joint Technical Capability Demonstrations to ensure Army space, missile defense, and high altitude equities are represented in advanced technology developments by demonstrating military utility when applied to military equipment and techniques. Examples include: supporting multi service experiments and capability development of the national-directed Phased Adaptive Approach (PAA) for Ballistic Missile Defense (BMD) as it is applied to each of the regional COCOMs; Developing effective Integrated Missile Defense concepts for Army support to the Phased Adaptive Approach (PAA) being implemented within each regional COCOM. A focus area will be informing the Missile Defeat Integrated Capability Development Working Group with experimentation on improving the timeliness and effectiveness of counter ballistic missile time sensitive targeting. Another project is developing and implementing a training environment for cyber defenders to train on defense of the GMD fire control networks through innovative scenario based training environments. Will support TRADOC proponents with their responsibilities relative to doctrine, organization, training, material, leader development and education, personnel, and facilities plus related matters to continue leveraging space, missile defense, and high altitude proponent input to Joint Capabilities Integration and Development System, Science and Technology, Concept Development, Capability Development.</p>			
<p>Title: Analysis, and Models and Simulations (M&S)</p> <p>Description: Funding is provided for the following efforts</p> <p>FY 2016 Accomplishments: Take the lessons learned from the FY15 efforts to continue to evaluate new technologies in realistic operating environments. This will be accomplished by supporting ongoing efforts that provide the most realistic operating environment available to perform technology gap and cost reduction analysis of space, missile defense, and high altitude systems. Realistic operating environments will be available to determine the ability of the specific technologies to fill capability gaps in terms of utility to the warfighter. Support of technology demonstrations, Analysis and Demonstration Tools/Test Beds for evolving space superiority and operationally responsive space concepts will address emerging needs and continue to be expanded to ensure that advanced</p>	4.110	3.798	3.858

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>technology development can adequately enhance space, missile defense and high altitude systems. The Future War Center (FWC) will continue to provide program management for maintenance, sustainment, and development for Extended Air Defense Simulation (EADSIM) delivering the required high fidelity synthetic operating environment to provide the capability to perform system and cost benefit analysis, operational planning, and exercise/ experimentation support. The FWC will continue to provide program management for maintenance, sustainment, and development for Reconfigurable Tactical Operations Simulator (RTOS) delivering operator in the loop capability for air and missile defense simulation in distributed exercises and experiments. Worked closely with the document integrators (DI) at United States Army Force Management Support Agency (USAFMSA) to document the 100th and 49th GMD Brigade and Battalion TOEs to ensure the accuracy of the documentation of the associated Force Design Updates. The DI to review the TOEs that were developed and captured the personnel and equipment changes as directed by the approved FDU's. This FDU confirmed the requirement for a non-standardized motor maintenance section, created additional operations officers within the GMD Brigade, and created a GMD master gunner/operations NCO to provide oversight of GMD qualification/certification within the Brigade S3. Equipment shortfalls and gaps that were identified were validated as new requirements. An ambulance was added to medical section to provide an organic medevac capability and the maintenance section received a much needed capability to self-recover their own vehicles and transport them to maintenance facilities over 350 miles away. Proper documentation of the TOE will allow this homeland defense unit to maintain their supremacy over the threat forces they keep at bay. By closely working with USAFMSA during the development of the TOEs, this ensured that the TOEs documented the results of the FDU accurately. Proper documentation of the FDUs ensures the 100th MD BDE and 49th MD BN will execute their mission of preventing the use of weapons of mass destruction, reduce hazards to friendly forces, and civilian populations. Secured the approval of both FDU Jr's for the 100th and 49th Missile Defense Brigade and Battalion at HQDA. With the lapse in HQDA organizational integrators (OI), these FDU Jr's were in hold status until a replacement OI was assigned. This caused a potential risk that the force structure changes would not be approved and have to be applied outside the original FY. Within weeks of the new OI being assigned, I briefed the OI on the FDU Jrs, the reason for the FDU Jr's and capability gaps the FDUs were correcting, both personnel and equipment shortfalls. This interaction with the OI allowed him to present these two FDU Jr's in an expeditious manner to the Army Staff at the 1-Star level. The FDU Jr's were approved by HQDA, and in time to have the TOE and MTOEs created that met the original time lines required to affect these changes in FY 17, thus saving pending force structure reductions from occurring. The changes to force structure and equipment capability gaps were resolved. Proper documentation of the FDUs ensures the 100th MD BDE and 49th MD BN will execute their mission of preventing the use of weapons of mass destruction, reduce hazards to friendly forces, and civilian populations.</p> <p>FY 2017 Plans: Force Design Assessment of Army Forces TAA 20-24 (APR 2016-MAR 2017) will introduce missile defense capabilities into the force. In order to bring those capabilities into the force development of new force design updates (FDUs) for FDU cycles 16-1, 16-2, 17-1 will be required. Additionally during the TAA cycle new Rules of Allocation (ROA) will be developed to ensure missile defense units are properly accounted for in the future. Take the lessons learned from the FY16 efforts to continue to evaluate new</p>			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab

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

technologies in realistic operating environments. This will be accomplished by supporting ongoing efforts that provide the most realistic operating environment available to perform technology gap and cost reduction analysis of space, missile defense, and high altitude systems. Realistic operating environments will be available to determine the ability of the specific technologies to fill capability gaps in terms of utility to the warfighter. Support of technology demonstrations, Analysis and Demonstration Tools/Test Beds for evolving space superiority, high altitude and operationally responsive space concepts will address emerging needs and continue to be expanded to ensure that advanced technology development can adequately enhance missile defense capabilities. The Future War Center (FWC) will continue to provide program management for maintenance, sustainment, and development for Extended Air Defense Simulation (EADSIM) delivering the required high fidelity synthetic operating environment to provide the capability to perform system and cost benefit analysis, operational planning, and exercise/ experimentation support. The FWC will continue to provide program management for maintenance, sustainment, and development for Reconfigurable Tactical Operations Simulator (RTOS) delivering operator in the loop capability for air and missile defense simulation in distributed exercises and experiments.

FY 2018 Plans:

"Support TAA 20-24 Resourcing Phase TAA is a phased force structure analysis process that defines the required Army force structure within end strength and accounts for the military and DA Civilian requirements and authorizations necessary to comply with DOD guidance. The TAA provides the basis for the Army's POM development and establishment of the POM Force. Resourcing and Approval, the determination must be made as to the level of acceptable risk to be taken for each capability. These capability demands are based on Army leadership directives, written guidance, risk analysis, the Army force generation approach and input from the Combatant Commander's Daily Operational Requirements (CCDOR). TAA builds a POM Force with which the PEGs can develop their portion of the Army's budget. The POM Force will also determine the OF enabler support force structure and define the Generating Force (GF) necessary to support and sustain the OF capabilities directed in strategic guidance. The determination of the composition of the Army force structure, or shape, is an iterative, risk-benefit, trade-off analysis process. Capability Demand Analysis is made up of two separate events: force guidance and quantitative analysis.

Participate in the Army's FDU process The FDU Includes capabilities development, capabilities determination, requirements approval, and implementation decisions. Develops organizational design solutions to overcome identified capability shortfalls that cannot be accommodated by doctrine, training, leadership and education, facility, or policy solutions. As part of the solution development, TRADOC CoEs force modernization proponents and non-TRADOC force management proponents consider courses of action across DOTMLPF-P with the intent of deriving materiel, personnel and organizational solutions as a last resort. Once an organizational solution becomes the recommendation, the force modernization proponent begins the integration process across the DOTMLPF-P domains.

FY 2016	FY 2017	FY 2018

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603305A / Army Missile Defense Systems Integration	Project (Number/Name) TR5 / Missile Defense Battlelab
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2016	FY 2017	FY 2018
Take the lessons learned from the FY17 efforts to continue to evaluate new technologies in realistic operating environments. This will be accomplished by supporting ongoing efforts that provide the most realistic operating environment available to perform technology gap and cost reduction analysis of space, missile defense, and high altitude systems. Realistic operating environments will be available to determine the ability of the specific technologies to fill capability gaps in terms of utility to the warfighter. Support of technology demonstrations, Analysis and Demonstration Tools/Test Beds for evolving space superiority, high altitude and operationally responsive space concepts will address emerging needs and continue to be expanded to ensure that advanced technology development can adequately enhance missile defense capabilities. The Future War Center (FWC) will continue to provide program management for maintenance, sustainment, and development for Extended Air Defense Simulation (EADSIM) delivering the required high fidelity synthetic operating environment to provide the capability to perform system and cost benefit analysis, operational planning, and exercise/ experimentation support. The FWC will continue to provide program management for maintenance, sustainment, and development for Reconfigurable Tactical Operations Simulator (RTOS) delivering operator in the loop capability for air and missile defense simulation in distributed exercises and experiments."			
Accomplishments/Planned Programs Subtotals	10.270	9.433	9.634

	FY 2016	FY 2017
Congressional Add: Thermal Management Systems Prototypes	19.000	-
FY 2016 Accomplishments: Continuous thermal loads: Environmental Control Units (ECU) operating at two thousand BTUs were built and are currently being tested to address addressing enhanced packaging, reliability and certification. These units have been integrated into a Patriot shelter in the GSIL testbed, an AM/ MSQ shelter IAMD TOC at SED, and at the test chamber at Rocky Research. Additional ECU types at higher power capability & generator package have been designed and manufactured to address larger system needs. These units are to designed to have 15% - 20% improved energy efficiency, reduced weight and operate at 12/24/48/600 Volt-DC; 110, 220, 460 Volt AC at world-wide available frequencies of 50 Hz, 60 Hz or 400 Hz for compatibility. A prototype of second generation fuel fired 100KW burst cooling for high energy lasers has been designed and tested.		
Congressional Adds Subtotals	19.000	-

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

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
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D. Acquisition Strategy
Not applicable for this item.

E. Performance Metrics
N/A

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603308A / <i>Army Space Systems Integration</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	29.561	32.431	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
990: <i>Space And Missile Defense Integration</i>	-	7.238	12.791	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
EB7: <i>Army Space System Enhancement/Integration</i>	-	22.323	19.640	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

- Beginning in FY2018 all project 990 funds will transfer to PE 1206308A, Project FE5.
- Beginning in FY2018 all project EB7 funds transition to PE 1206308A project FE6 and PE 1205117A project FG3.

A. Mission Description and Budget Item Justification

The program element funds space systems integration efforts performed by the US Army Space and Missile Defense Command/ Army Forces Strategic Command (USASMDC/ARSTRAT) and the Program Executive Office for Intelligence, Electronic Warfare (PEO IEW&S).

Project EB7 - PEO IEW&S/USASMDC/ARSTRAT: Details of this program are reported in accordance with Title 10, United States Code, Section 119 (a)(1).

Project 990 funds USASMDC/ARSTRAT to integrate warfighting concepts and technologies, validate concepts, and identify capabilities needed to implement the validated concepts, and develop DOTMLPF solutions to realize those space and high altitude related capabilities. Provide engineering support to the Joint Friendly Force Tracking (J-FFT) Mission Management Center (MMC) through an associated test-bed for both operational and developmental injection and integration of real-time J-FFT information into the Common Operating Picture (COP) for Combatant Commanders (COCOMs), Joint Task Forces (JTFs), and Coalition Partners. The MMC injects real-time J-FFT information into the COP for COCOMs, JTFs and Coalition partners. USSTRATCOM, in accordance with CJCSI 3910.01 (reference V.4.) is designated one of three coordinating agencies for J-FFT within DoD. CJCSI 3910.01 directs eight Force Modernization tasks to USSTRATCOM. USSTRATCOM SI 534-5 (reference V.6.) and annually published USSTRATCOM operations orders have designated USASMDC/ARSTRAT as the lead USSTRATCOM component command for Friendly Force Tracking (FFT).

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603308A / <i>Army Space Systems Integration</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	25.061	32.431	36.772	-	36.772
Current President's Budget	29.561	32.431	0.000	-	0.000
Total Adjustments	4.500	0.000	-36.772	-	-36.772
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	4.500	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	-36.772	-	-36.772

Change Summary Explanation

- Beginning in FY2018 all project 990 funds will transfer to PE 1206308A, Project FE5.
- Beginning in FY2018 all project EB7 funds transition to PE 1206308A project FE6 and PE 1205117A project FG3.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration				Project (Number/Name) 990 / Space And Missile Defense Integration			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
990: Space And Missile Defense Integration	-	7.238	12.791	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project will transition to PE 120630A Project FE5

A. Mission Description and Budget Item Justification

USASMD/ARSTRAT: Headquarters, Department of the Army General Order 37, dated 16 October 2006, designated USASMD/ARSTRAT as the Army proponent for space and ground-based midcourse defense (GBMD), the Army integrator for global missile defense, and the Army Service Component Command (ASCC) of the U.S. Strategic Command (USSTRATCOM). Army Regulation (AR) 10-87 Army Commands, Army Service Component Commands, and Direct Reporting Units, dated 4 September 2007 and AR 5-22 The Army Force Modernization Proponent System dated 19 August 2009 designate USASMD/ARSTRAT as the Army specified proponent for Global Missile Defense and Space/High Altitude capabilities. As the Army proponent for space, high altitude and GMD, USASMD/ARSTRAT develops warfighting concepts, conducts warfighting experiments to validate those concepts, identifies capabilities needed to implement the validated concepts, and develops Doctrine, Organizations, Training, Material, Leadership & Education, Personnel, Facilities and Policy (DOTMLPF-P) solutions to realize the GBMD capabilities. As the Army integrator for global missile defense, USASMD/ARSTRAT is responsible for reviewing programs managed by the Army, other Services, Defense agencies and National agencies to ensure that they are correctly synchronized and will ultimately provide the capabilities required by USSTRATCOM to execute its global missile defense responsibilities.

Project 990 funds United States Army Space and Missile Command/Army Strategic Command (USASMD/ARSTRAT) efforts to develop, analyze and mature warfighting concepts, and conduct warfighting experiments for space and high altitude capabilities. The program also funds development and integration of new data sources and data services into the Joint Friendly Force Tracking Mission Management Center. The Mission Management Center (MMC) injects real-time Joint Friendly Force Tracking (J-FFT) information into the Common Operating Picture for Combatant Commands (COCOMs), Joint Task Forces (JTFs) and Coalition partners. USASMD/ARSTRAT is the proponent for space / high altitude capabilities and is responsible for determining and integrating Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF-P) for the Army.

USSTRATCOM, in accordance with CJCSI 3910.01 (reference V.4.) is designated one of three coordinating agencies for J-FFT within DOD. CJCSI 3910.01 directs eight Force Modernization tasks to USSTRATCOM. USSTRATCOM SI 534-5 (reference V.6.) and annually published USSTRATCOM operations orders have designated USASMD/ARSTRAT as the lead USSTRATCOM component command for J-FFT.

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

	FY 2016	FY 2017	FY 2018
Title: Architecture Development, Wargames and Demonstrations	6.174	8.716	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration	Project (Number/Name) 990 / Space And Missile Defense Integration

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Description: Funding is provided for the following efforts</p> <p>FY 2016 Accomplishments: Planned, developed, and executed architectures and combat development solutions for Army integration of space systems, space control capabilities, missile defense and high altitude systems. Represented Army positions and defended Army equities relative in Joint/DoD and inter-Service activities; e.g., Executive Agent for Space Program Assessments, etc. Planned and executed wargames to evaluate emerging concepts within the space and high altitude domains as well as participated and provided support to Army and Joint wargames and experiments where space and high altitude capabilities and technologies were be integrated and evaluated in the most realistic operating environment possible. This was necessary to ensure that space, high altitude and cyber capability gaps were identified and capabilities were correctly represented so that the Army's use of these capabilities was explored and where possible, exploited. Developed and maintained One Semi-Automated Force (OneSAF) simulation space updated and provided to PEO STRI to be included in OneSAF baseline. Developed space modernization strategies and sponsor exploration of future space and high altitude warfighting concepts. USASMDC/ARSTRAT continued efforts to enhance the resiliency and effectiveness of critical space-based assets and JCIDS capability development activities for space superiority, high altitude persistent platforms, nano-satellites and tactical launch systems. Products delivered in FY16 included Army Cyberspace Analysis; Space Superiority Analysis of Alternatives and Cost-Benefit Analysis updates: Overhead Persistence Infrared (OPIR) Analysis; Assessment of Hostile use of Space Force Enhancement; and Position Navigation Timing (PNT) analysis.</p> <p>FY 2017 Plans: Will plan, develop, and execute architectures and combat development solutions for Army integration of space systems, space control capabilities, missile defense and high altitude systems. Represent Army positions and defend Army equities relative in Joint/DoD and inter-Service activities; e.g., Executive Agent for Space Program Assessments, etc. Will plan and execute wargames to evaluate emerging concepts within the space and high altitude domains as well as participate and provide support to Army and Joint wargames and experiments where space and high altitude capabilities and technologies can be integrated and evaluated in the most realistic operating environment possible. This is necessary to ensure that space, high altitude and cyber capability gaps are identified and capabilities are correctly represented so that the Army's use of these capabilities is explored and where possible, exploited. Will develop and maintain One Semi-Automated Force (OneSAF) simulation space updates and provide to PEO STRI to be included in OneSAF baseline. Will develop space modernization strategies and sponsor exploration of future space and high altitude warfighting concepts. USASMDC/ARSTRAT will continue efforts to enhance the resiliency and effectiveness of critical space-based assets and JCIDS capability development activities for space superiority, high altitude persistent platforms, nano-satellites and tactical launch systems. Products scheduled to be delivered in FY17 include Army Cyberspace Analysis; Space Superiority Analysis of Alternatives and Cost -Benefit Analysis updates: Overhead Persistence Infrared (OPIR) Analysis; Assessment of Hostile use of Space Force Enhancement; and Position Navigation Timing (PNT) analysis. TAA 20-24 (APR 2016-MAR 2017) will introduce new space capabilities into the force. In order to bring those</p>			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration	Project (Number/Name) 990 / Space And Missile Defense Integration

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
capabilities into the force development of new force design updates (FDUs) for FDU cycles 16-1, 16-2, 17-1 will be required. Additionally during the TAA cycle new Rules of Allocation (ROA) will be developed to ensure SRC40 units are properly accounted for in the future POM force.			
<p>Title: High Energy Laser Technolgy Program Support</p> <p>Description: Funding is provided for the following effort.</p> <p>FY 2016 Accomplishments: Supported the efficient rugged laser program as it went into the completion phase of a 60kW laser system for installation into the HELMD mobile platform; supported efficient rugged laser reviews and technical interchange meetings; supported safety and security assessments and analysis of a potential future laser weapon system; conducted trade analysis studies on current and future high power laser concepts; supported conduct of technical assessments of advanced laser technologies and help assess the diode pumped gas laser research effort; supported power and thermal subsystems development and system engineering between the 60 kW class laser, power and thermal subsystem, and the HELMD platform/beam control system; supported Solid state Laser Testbed (SSLT) operations at the High Energy Laser Systems Test Facility (HELSTF) to evaluate 1.06um SSL propagation and lethality experiments; supported the development of tactics, techniques, and procedures (TTPs) of future fielding of HEL weapon system.</p> <p>FY 2017 Plans: Will support the High Energy Laser Mobile Demonstrator (HELMD) as it goes into the integration phase of the electrical power subsystem (EPS), thermal management subsystem (TMS), and 60 kW Laser Subsystem (LSS) into the HELMD mobile platform; support reviews and technical interchange meetings, Technical Review Boards (TRB), and Risk and Opportunity Management Boards (ROMB) for subsystems; support safety and security assessments and analysis of a potential future laser weapon system; conduct trade analysis studies on current and future high power laser concept; support Solid State Laser Testbed (SSLT) operations at the High Energy Laser Systems Test Facility (HELSTF) to evaluate 1.06um SSL propagation and lethality experiments; support the development of tactics, techniques, and procedures (TTPs) of future fielding of HEL weapon system.</p>	0.516	0.072	-
<p>Title: Joint Friendly Force Tracking (J-FFT) Testbed</p> <p>Description: Funding is provided for the following efforts</p> <p>FY 2016 Accomplishments: SMDC/ARSTRAT's J-FFT Testbed continued to execute the CJCS task to provide a development and testing capability to ensure FFT data is integrated for operational use/display. Main efforts were dedicated to agile development, testing and delivery of Force Tracking Advanced Management System (FTAMS) capabilities, the core software suite supporting the Joint Force Tracking Mission Management Center's 24/7 data services to combatant commands, agencies and coalition forces. These</p>	0.548	4.003	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration	Project (Number/Name) 990 / Space And Missile Defense Integration

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>efforts have enabled over 55 device types and 3,000 daily tracks to be supported by the MMC. A second line of effort provided sustainment and Independent Verification and Validation (IV&V) support to SOCOM and Army Tagging, Tracking and Locating (TTL) programs. This included deliveries of new capabilities and devices that are enabled by the KeyMaker architecture hosted by the MMC for use by SOF, Army and Marine forces. In support of the KeyMaker Unclassified systems the J-FFT Testbed procured, tested and deployed a Force Tracking Cloud solution using the Amazon Web Services provider that reduced costs and improved performance. The J-FFT Testbed also satisfied FFT user requirements by executing capability development and test cycles for over a dozen JIIM user projects that included support to the Bold Quest 16.1 Coalition Capability Assessment, development of a new NATO FFT message standard (STANAG 5527) for coalition interoperability, FT support to the US Pacific Fleet "Rim of the Pacific" (RIMPAC) exercise, and transition of the Simply Aware application supporting US Army Africa and a proof of concept to meet Army Movement Tracking System needs.</p> <p>FY 2017 Plans: As enhancements are made to network-enabled command and control systems, including KeyMaker, Joint Friendly Force Tracking (J-FFT) will be fully integrated into Combat Commanders' friendly force tracking requirements and the J-FFT Testbed will be used to integrate hardware and software prior to its deployment to the field. USASMDC/ARSTRAT will continue to support development of Friendly Force Tracking (FFT) capabilities for deployed and coalition forces. The J-FFT Division coordinates and executes USSTRATCOM-directed FFT tasks in order to assure continuous 24/7 FFT data services support to authorized users to include the Combatant Commands, the Services, agencies, allies, and coalition partners in order to improve their situational awareness (SA), enhance command and control (C2) to reduce fratricide in combat, homeland defense, civil and contingency operations. Will complete transition Force Tracking Advanced Management System (FTAMS) to FFT-Mission Management Center (MMC).</p>			
Accomplishments/Planned Programs Subtotals	7.238	12.791	-

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

N/A

Remarks

D. Acquisition Strategy

Not applicable for this effort.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603308A / Army Space Systems Integration			Project (Number/Name) EB7 / Army Space System Enhancement/ Integration				
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EB7: Army Space System Enhancement/Integration	-	22.323	19.640	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Note

Funding transferred from PE 0603308A project EB7 transition to PE 1206308A project FE6 and PE 1205117A project FG3 beginning in FY 2018.

The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).

Funding line is shared between USA Space and Missile Defense Command (SMDC) and Program Executive Office Intelligence, Electronic Warfare and Sensors (PEO IEW&S) starting in FY2018. Funding transferred from PE 0603308A project EB7 transition to PE 1206308A project FE6 and PE 1205117A project FG3 beginning in FY 2018.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603327A / Air and Missile Defense Systems Engineering
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	14.200	33.949	15.000	48.949	35.795	24.939	28.268	33.370	Continuing	Continuing
FG9: Air and Missile Defense (AMD) Electronic Warfare	-	0.000	14.200	33.949	15.000	48.949	35.795	24.939	28.268	33.370	Continuing	Continuing

Note

Note: FY2018 funding in the amount of \$5.939M was realigned from this Program Element (PE) to PE 0604741A, Project 126.

A. Mission Description and Budget Item Justification

Funding in this program supports efforts to assess Army Air and Missile Defense (AMD) performance and system vulnerabilities to threats from Cyber and Electromagnetic Activities (CEMA). Army AMD sensors, Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS) Command and Control (C2), Radio Frequency (RF) data and voice networks will be assessed against current and postulated threat systems and techniques. Potential solutions developed by the Army, other Services, and Defense agencies (for example Missile Defense Agency) to close identified gaps will be demonstrated and assessed in live and simulated CEMA environments. Assessment events will be conducted approximately every two years. Analysis of results and implementation of potential solutions will occur between events using system-specific funding. The proposed solutions will then be assessed at the next event after implementation.

Included in this line are funds to plan and execute periodic CEMA activities with Army AMD systems, to include other Service and other Agency AMD systems as appropriate. Upon completion of CEMA demonstration analyses, create concepts for mitigating Army AMD sensor, C2, and RF data link vulnerabilities. Efforts in this program will also develop tools for use by Army AMD systems to improve overall system performance in contested environments, to include effects-based CEMA Modeling and Simulation (M&S) to assess Army AMD CEMA concepts in Hardware-In-The-Loop (HWIL) environment. Collaboration is required with United States Strategic Command (USSTRATCOM) Joint Electromagnetic Preparedness for Advanced Combat (JEPAC) to evaluate, modify, and field existing Army AMD EP Tactics, Techniques, and Procedures (TTPs) in a Joint environment. Additionally, there will be continual interface with intelligence communities to maintain cognizance of emerging CEMA threats and incorporate these threats in future CEMA demonstrations. An output from these activities will be development of a time-phased roadmap that identifies the investments needed to improve the CEMA capabilities of Army AMD sensors, C2, and RF data and voice networks.

Funds in this line will also be used to transition the Army Low-Cost Portable Surveillance (ALPS) sensor from Science and Technology (S&T) into an emerging Program of Record (PoR). Initially, prototype systems will be provided to meet a Combatant Command identified need and to conduct an operational assessment. This program will also develop and integrate ALPS into the Army Integrated Air & Missile Defense (AIAMD) Battle Command System (IBCS) to improve the CEMA posture of the Army's AMD architecture. The objectives of this effort are to prove component and subsystem maturity in a system-of-systems environment and to reduce subsequent PoR integration risk.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date: May 2017**

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603327A / <i>Air and Missile Defense Systems Engineering</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	14.200	33.949	15.000	48.949
Total Adjustments	0.000	14.200	33.949	15.000	48.949
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	14.200	33.949	15.000	48.949

Change Summary Explanation

FY2017 funding in the amount of \$14.200 million is included in the March 2017 Request for Additional Appropriations.

FY2018 base funding in the amount of \$5.939 million was realigned from Program Element (PE) 0604741A, Project 126. Additionally, base funding increased by \$13.010 million for ALPS development/integration and \$15.000 million for CEMA activities.

FY2018 Overseas Contingency (OCO) fund in the amount of \$15.000 million support a Combatant Command identified need for ALPS and to continue the operational assessment started with FY17 funding in the Request for Additional Appropriations.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603327A / Air and Missile Defense Systems Engineering				Project (Number/Name) FG9 / Air and Missile Defense (AMD) Electronic Warfare			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
FG9: Air and Missile Defense (AMD) Electronic Warfare	-	0.000	14.200	33.949	15.000	48.949	35.795	24.939	28.268	33.370	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Note: FY2018 funding in the amount of \$5.939M was realigned from this Program Element (PE) to PE 0604741A, Project 126.

A. Mission Description and Budget Item Justification

Funding in this program supports efforts to assess Army Air and Missile Defense (AMD) performance and system vulnerabilities to threats from Cyber and Electromagnetic Activities (CEMA). Army AMD sensors, Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS) Command and Control (C2), Radio Frequency (RF) data and voice networks will be assessed against current and postulated threat systems and techniques. Potential solutions developed by the Army, other Services, and Defense agencies (for example Missile Defense Agency) to close identified gaps will be demonstrated and assessed in live and simulated CEMA environments. Assessment events will be conducted approximately every two years. Analysis of results and implementation of potential solutions will occur between events using system-specific funding. The proposed solutions will then be assessed at the next event after implementation.

Included in this line are funds to plan and execute periodic CEMA activities with Army AMD systems, to include other Service and other Agency AMD systems as appropriate. Upon completion of CEMA demonstration analyses, create concepts for mitigating Army AMD sensor, C2, and RF data link vulnerabilities. Efforts in this program will also develop tools for use by Army AMD systems to improve overall system performance in contested environments, to include effects-based CEMA Modeling and Simulation (M&S) to assess Army AMD CEMA concepts in Hardware-In-The-Loop (HWIL) environment. Collaboration is required with United States Strategic Command (USSTRATCOM) Joint Electromagnetic Preparedness for Advanced Combat (JEPAC) to evaluate, modify, and field existing Army AMD EP Tactics, Techniques, and Procedures (TTPs) in a Joint environment. Additionally, there will be continual interface with intelligence communities to maintain cognizance of emerging CEMA threats and incorporate these threats in future CEMA demonstrations. An output from these activities will be development of a time-phased roadmap that identifies the investments needed to improve the CEMA capabilities of Army AMD sensors, C2, and RF data and voice networks.

Funds in this line will also be used to transition the Army Low-Cost Portable Surveillance (ALPS) sensor from Science and Technology (S&T) into an emerging Program of Record (PoR). Initially, prototype systems will be provided to meet a Combatant Command identified need and to conduct an operational assessment. This program will also develop and integrate ALPS into the Army Integrated Air & Missile Defense (AIAMD) Battle Command System (IBCS) to improve the CEMA posture of the Army's AMD architecture. The objectives of this effort are to prove component and subsystem maturity in a system-of-systems environment and to reduce subsequent PoR integration risk.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Advanced Electronic Protection Enhancements and ALPS Development/Integration	-	14.200	33.949	15.000	48.949

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603327A / Air and Missile Defense Systems Engineering	Project (Number/Name) FG9 / Air and Missile Defense (AMD) Electronic Warfare

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Description: Provides CEMA planning, conducts CEMA demonstrations and post-mission analysis, and develop/integrate ALPS.</p> <p>FY 2017 Plans: Provide ALPS prototype systems to meet a Combatant Command identified need and begin an operational assessment. Begin development and integration of ALPS into Integrated Air & Missile Defense (IAMD) Battle Command System (IBCS).</p> <p>FY 2018 Base Plans: Funding is provided for additional analysis of the P-11 event output, along with initial planning and preparation for the P-12 event. Funding will also be used to continue the Cyber and Electromagnetic Activities (CEMA) roadmap and strategy that ensures coordination and execution of prioritized goals. Virtualize IAMD and PATRIOT components, validate the models, and assess them in a contested environment. Begin virtualization of additional IAMD sensors and launchers. Continue ALPS development and integration of ALPS into the Army AMD architecture.</p> <p>FY 2018 OCO Plans: Provide additional ALPS prototype systems to meet a Combatant Command identified need and continue the operational assessment.</p>					
Accomplishments/Planned Programs Subtotals	-	14.200	33.949	15.000	48.949

<p>C. Other Program Funding Summary (\$ in Millions) N/A</p> <p>Remarks Not applicable for this item.</p> <p>D. Acquisition Strategy Assessment events will be conducted approximately every two years in live and simulated Cyber and Electromagnetic Activity environments. In addition to government planning and conduct of assessments, funding will also be provided through various contracts for subject matter expertise.</p> <p>ALPS will utilize an existing Defense Ordinance Technology Consortium (DOTC) Section 845 Other Transaction Authority (OTA) agreement to develop and integrate prototypes in AIAMD architecture. An operational assessment will be used to refine ALPS requirements and assess the longer-term strategy.</p>
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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603327A / <i>Air and Missile Defense Systems Engineering</i>	Project (Number/Name) FG9 / <i>Air and Missile Defense (AMD) Electronic Warfare</i>

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603327A / Air and Missile Defense Systems Engineering				FG9 / Air and Missile Defense (AMD) Electronic Warfare							
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Government Program Management	Various	Various : Various	2.252	-		0.900	Aug 2017	3.100	Nov 2017	-		3.100	Continuing	Continuing	Continuing
Subtotal			2.252	-		0.900		3.100		-		3.100	-	-	-
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
System Integration Assessment	Various	Various : Various	1.218	-		-		0.200	Dec 2017	-		0.200	Continuing	Continuing	Continuing
ALPS Development/Integration	Various	Various : Various	0.000	-		13.300	Aug 2017	11.110	Jan 2018	15.000	Jan 2018	26.110	Continuing	Continuing	Continuing
Subtotal			1.218	-		13.300		11.310		15.000		26.310	-	-	-
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Component Assessments & Research and Trade Studies	Various	Various : Various	5.137	-		-		15.339	Feb 2018	-		15.339	Continuing	Continuing	Continuing
Subtotal			5.137	-		-		15.339		-		15.339	-	-	-
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Demonstration Planning and Execution	Various	Various : Various	0.000	-		-		4.200	Nov 2017	-		4.200	Continuing	Continuing	Continuing
Subtotal			0.000	-		-		4.200		-		4.200	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army							Date: May 2017				
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603327A / Air and Missile Defense Systems Engineering				Project (Number/Name) FG9 / Air and Missile Defense (AMD) Electronic Warfare				
	Prior Years	FY 2016	FY 2017		FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	8.607	-	14.200		33.949	15.000	48.949	-	-	-	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603327A / Air and Missile Defense Systems Engineering	Project (Number/Name) FG9 / Air and Missile Defense (AMD) Electronic Warfare
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
P-11 Demonstration Planning Efforts																												
P-11 Demonstration																												
P-11 Analysis Efforts, Trade Studies, and Implementation																												
P-12 Demonstration Planning Efforts																												
P-12 Demonstration																												
P-12 Analysis Efforts, Trade Studies, and Implementation																												
P-13 Demonstration Planning Efforts																												
P-13 Demonstration																												
P-13 Analysis Effort, Trade Studies, and Implementation																												
P-14 Demonstration Planning Efforts																												
ALPS Prototype Development and Integration																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603327A / Air and Missile Defense Systems Engineering	Project (Number/Name) FG9 / Air and Missile Defense (AMD) Electronic Warfare

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
P-11 Demonstration Planning Efforts	1	2017	1	2018
P-11 Demonstration	2	2018	3	2018
P-11 Analysis Efforts, Trade Studies, and Implementation	3	2018	1	2019
P-12 Demonstration Planning Efforts	3	2018	2	2019
P-12 Demonstration	3	2019	4	2019
P-12 Analysis Efforts, Trade Studies, and Implementation	1	2020	4	2020
P-13 Demonstration Planning Efforts	4	2020	2	2021
P-13 Demonstration	3	2021	3	2021
P-13 Analysis Effort, Trade Studies, and Implementation	4	2021	2	2022
P-14 Demonstration Planning Efforts	1	2022	4	2022
ALPS Prototype Development and Integration	4	2017	4	2021

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	40.943	72.117	72.909	-	72.909	76.845	76.889	78.887	81.694	Continuing	Continuing
606: <i>Cntrmn/Barrier Adv Dev</i>	-	0.000	3.757	4.149	-	4.149	3.149	3.200	3.264	3.184	0.000	20.703
EK7: <i>Area Denial Capability Development</i>	-	40.943	68.360	68.760	-	68.760	73.696	73.689	75.623	78.510	Continuing	Continuing

Note

Project EK7, Area Denial Capability Development is a new start in FY 2016.

Project 606, Cntrmn/Barrier Adv Dev is a new start in FY 2017.

A. Mission Description and Budget Item Justification

This Program Element (PE) provides for the Concept Exploration and Refinement of a Deep-Range employed Networked Obstacle. This PE develops alternatives to the aging inventory of 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 a Deep-Range employed Networked Obstacle. The obstacle will be delivered via fixed wing aircraft and 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 establish early Situational Awareness of an area without exposing friendly forces to enemy engagement, and to actively detect, and engage the enemy in order to shape the battlespace at deep operational ranges. Area Denial Capability Development will utilize an open system, modular architecture to facilitate future development, maintenance, repair, and product improvements.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	45.757	72.117	73.095	-	73.095
Current President's Budget	40.943	72.117	72.909	-	72.909
Total Adjustments	-4.814	0.000	-0.186	-	-0.186
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.000	-			
• SBIR/STTR Transfer	-1.814	-			
• Adjustments to Budget Years	0.000	0.000	0.006	-	0.006
• Other Adjustments 1	0.000	0.000	-0.192	-	-0.192

Change Summary Explanation

Funding deltas attributable to realigned higher priorities.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev	Project (Number/Name) 606 / Cntrmn/Barrier Adv Dev
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
606: Cntrmn/Barrier Adv Dev	-	0.000	3.757	4.149	-	4.149	3.149	3.200	3.264	3.184	0.000	20.703
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 FY 2018 Base RDTE dollars in the amount of \$4.149 million supports Explosive Hazard Detection technology analysis, system analysis, test design and evaluation. It also funds system engineering and program management.

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

	FY 2016	FY 2017	FY 2018
<p>Title: System Engineering and Program Management</p> <p>Description: Supports System Engineering and Program Management</p> <p>FY 2017 Plans: Supports System Engineering and Program Management</p> <p>FY 2018 Plans: Supports System Engineering and Program Management</p>	-	0.400	1.435
<p>Title: Explosive Hazard Detection Technology Development</p> <p>Description: Explosive Hazard Detection Technology Analysis</p> <p>FY 2017 Plans: Explosive Hazard Detection technology analysis, system analysis, and test design.</p> <p>FY 2018 Plans: Explosive Hazard Detection development and evaluation of evolving technologies</p>	-	2.850	2.440
<p>Title: Explosive Hazard Detection Test and Evaluation</p> <p>Description: Explosive Hazard Detection Test and Evaluation</p> <p>FY 2017 Plans:</p>	-	0.507	0.274

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) 606 / <i>Cntrmn/Barrier Adv Dev</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Explosive Hazard Detection Test and Evaluation			
<i>FY 2018 Plans:</i> Conduct testing of candidate technologies.			
Accomplishments/Planned Programs Subtotals	-	3.757	4.149

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PE 0604808A Proj 415 RDTE: <i>PE 0604808A Proj 415 Mine Neutralization/Detection</i>	49.724	36.858	19.848	-	19.848	30.617	38.202	25.732	30.011	Continuing	Continuing
• R64001 OPA: <i>R64001 OPA Husky Mounted Detection System (HMDS)</i>	13.565	0.274	21.695	-	21.695	41.423	50.646	81.219	46.019	Continuing	Continuing

Remarks
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.

D. Acquisition Strategy
The Acquisition Strategy for Route Clearance Operations will be developed in conjunction with program initiation.

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 FY2018, 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.

E. Performance Metrics
N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>				Project (Number/Name) EK7 / <i>Area Denial Capability Development</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
<i>EK7: Area Denial Capability Development</i>	-	40.943	68.360	68.760	-	68.760	73.696	73.689	75.623	78.510	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides for the Development of a Deep-Range employed Networked Obstacle to replace the aging inventory of the Family of Scatterable Mines systems.

Area Denial Capability Development will evaluate integrated technologies and prototype systems in a realistic operating environment to expedite technology transition for a Deep-Range employed Networked Obstacle. The obstacle will be delivered via fixed wing aircraft and 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 establish early Situational Awareness of an area without exposing friendly forces to enemy engagement, and to actively detect, and engage the enemy in order to shape the battlespace at deep 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)

	FY 2016	FY 2017	FY 2018
Title: Area Denial Capability Development	26.571	52.254	51.386
Description: 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.			
FY 2016 Accomplishments: Awarded 4 contract agreements to build prototypes that represent system and sub-system level concepts. The concepts and prototypes were evaluated for technical maturity and potential operational effectiveness, suitability, and affordability.			
FY 2017 Plans: Award four follow-on prototyping agreements to continue development of competing system prototypes, perform technical/ engineering analysis of preferred materiel solution, inform the Capability Development Document (CDD) requirements, reduce program technical risk, and program cost risk.			
FY 2018 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) EK7 / <i>Area Denial Capability Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
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.				
<p>Title: Engineering Support</p> <p>Description: Provide Engineering Support.</p> <p>FY 2016 Accomplishments: Engineering support for Analysis of Alternatives, Concept Prototype Contract/Agreement Award, initial development of Models and Simulations, Milestone A Documentation, and Technology Readiness Assessment of Concept Prototypes.</p> <p>FY 2017 Plans: Engineering support for follow-on prototyping contracts/agreements and execution. Develop models and simulations, develop Milestone A documentation, conduct technology readiness assessment, and support requirements development.</p> <p>FY 2018 Plans: 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.</p>		10.101	9.660	10.156
<p>Title: Test and Evaluation</p> <p>Description: Provide support to Contractor/Government test Activities.</p> <p>FY 2016 Accomplishments: Conducted test planning for a Technical Demonstration and Evaluation of system and sub-system level prototypes. Developed test scenarios and vignettes. Conducted multiple site surveys and selected appropriate test ranges and facilities. Supported contractor test planning.</p>		0.429	-	-
<p>Title: Program Management and Oversight</p> <p>Description: Program Management and Support</p> <p>FY 2016 Accomplishments: Program Management support for Analysis of Alternatives, Test and Evaluation, Modeling and Simulation, Milestone A planning, and Concept Prototype contracts/agreements.</p> <p>FY 2017 Plans:</p>		3.842	6.446	7.218

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) EK7 / <i>Area Denial Capability Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Program Management support for technical/engineering analysis of materiel solution, Modeling and Simulation, Capability Development Document requirements development, competitive prototype contracts/agreements, and Milestone A preparation.</p> <p>FY 2018 Plans: 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 phase development contracts/agreements. Conduct industry engagements.</p>				
Accomplishments/Planned Programs Subtotals		40.943	68.360	68.760
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
N/A				
D. Acquisition Strategy				
<p>An Analysis of Alternatives (AoA) was completed in October 2016 which assessed the technical feasibility, operational feasibility, technical risk, and affordability of various potential materiel solutions. The Analysis of Alternatives was informed by previously executed studies and input from Government, Industry and Academia. In parallel to the Analysis of Alternatives, 4 Concept Prototype contracts/agreements were awarded to industry to develop representative prototypes (hardware and/or models) that will be used to assess the technology risks and costs associated with multiple system level concepts. The results of the Analysis of Alternatives and evaluation of representative prototypes will support a 3QFY18 Milestone A Decision. The Army will award contracts/agreements to conduct an analysis of current Bomb Unit technology that will inform future development requirements during the Technology Maturation and Risk Reduction (TMRR) phase. The Army will award two Technology Maturation and Risk Reduction (TMRR) contracts/ agreements to develop competing prototypes of the selected materiel solution. Technologies that support the selected system level concepts will be matured during Technology Maturation and Risk Reduction, and a Capability Development Document (CDD) will be developed. At the end of Technology Maturation and Risk Reduction, and after a successful Milestone B Decision, the Army will competitively award an Engineering and Manufacturing Development (EMD) contract to complete development of the system, complete system integration, develop manufacturing processes, and conduct testing before entering the Production and Deployment phase.</p>				
E. Performance Metrics				
N/A				

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date: May 2017**

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) EK7 / <i>Area Denial Capability Development</i>
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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	MIPR	PM-CCS : Picatinny Arsenal, NJ	0.000	3.841		4.700		4.474		-		4.474	Continuing	Continuing	0.000
SBIR/STTR/FFRDC	TBD	PM CCS : Picatinny Arsenal, NJ	0.000	-		1.746		2.750		-		2.750	Continuing	Continuing	0.000
Subtotal			0.000	3.841		6.446		7.224		-		7.224	-	-	0.000

Remarks
 Small Business Innovative Research (SBIR) cost are \$1,577,000.
 Small Business Technology Transfer (STTR) costs are \$237,000.

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Prototype Development A	SS/CPFF	Orbital ATK : Plymouth, MN	0.000	8.351	Feb 2016	-		-		-		-	0.000	8.351	0.000
Prototype Development B	SS/CPFF	Textron Defense Systems : Wilmington, MA	0.000	7.829	Feb 2016	-		-		-		-	0.000	7.829	0.000
Prototype Development C	SS/FFP	Fantastic Data LLC : San Fransisco, CA	0.000	7.363	Feb 2016	-		-		-		-	0.000	7.363	0.000
Prototype Development D	SS/CPFF	Northrop Grumman Systems Corporation : Redondo Beach, CA	0.000	3.028	Feb 2016	-		-		-		-	0.000	3.028	0.000
Technology Maturation Risk Reduction (TMRR) Development A	SS/TBD	TBD : TBD	0.000	-		26.127	Jun 2017	25.690	Jan 2018	-		25.690	Continuing	Continuing	0.000
Technology Maturation Risk Reduction (TMRR) Development B	SS/TBD	TBD : TBD	0.000	-		26.127	Jun 2017	25.690	Jan 2018	-		25.690	Continuing	Continuing	0.000
Subtotal			0.000	26.571		52.254		51.380		-		51.380	-	-	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0603619A / Landmine Warfare and Barrier - Adv Dev				Project (Number/Name) EK7 / Area Denial Capability Development							
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	0.000	3.484		5.284		5.110		-		5.110	Continuing	Continuing	0.000
CERDEC Engineering Support	MIPR	CERDEC : Fort Belvoir, VA	0.000	0.497		1.168		0.275		-		0.275	Continuing	Continuing	0.000
Mitre Engineering Support (C4)	FFRDC	Mitre : McLean, VA	0.000	0.863	Aug 2016	0.440		1.000		-		1.000	Continuing	Continuing	0.000
NVESD Engineering Support	MIPR	NVESD : Fort Belvoir, VA	0.000	0.440		0.800		0.800		-		0.800	Continuing	Continuing	0.000
Fibertek, INC. Operational Contractor Support	C/CPFF	FIBERTEK, INC. : Herndon, VA	0.000	0.131	Aug 2016	-		0.500		-		0.500	0.000	0.631	0.000
Millenium Program Support	C/FFP	Millennium Corporation : Arlington, VA	0.000	-		0.500		-		-		-	Continuing	Continuing	0.000
ARL Engineering Support	MIPR	ARMY RESEARCH LABORATORY (ARL) : Adelphi, MD	0.000	0.633		0.850		0.850		-		0.850	Continuing	Continuing	0.000
AMSAA Engineering Support	MIPR	Army Materiel Systems Analysis Activity (AMSAA) : Aberdeen, MD	0.000	0.663		0.206		0.215		-		0.215	Continuing	Continuing	0.000
TRAC Analysis Support	MIPR	TRADOC Analysis Center (TRAC) : White Sands, NM	0.000	2.200		-		-		-		-	0.000	2.200	0.000
USAF Engineering and Integration Support	SS/CPFF	Air Force Life Cycle Management Center, Armament Systems Development Division : Eglin AFB, FL	0.000	1.191	Dec 2016	0.206		1.200		-		1.200	Continuing	Continuing	0.000
USN Engineering and Integration Support	MIPR	TBD : TBD	0.000	-		0.206		0.206		-		0.206	Continuing	Continuing	0.000
Subtotal			0.000	10.102		9.660		10.156		-		10.156	-	-	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army											Date: May 2017			
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>					Project (Number/Name) EK7 / <i>Area Denial Capability Development</i>				

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Support Government Test Activities	MIPR	USAF 96th Test Squadron / OGEX : Eglin AFB, FL	0.000	0.429		-		-		-		-	Continuing	Continuing	0.000
Subtotal			0.000	0.429		-		-		-		-	-	-	0.000

			Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	40.943	68.360	68.760	-	68.760	-	-	0.000

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) EK7 / <i>Area Denial Capability Development</i>
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022							
	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				
Model and Simulation Development																																
(1) Concept Prototype Agreements Award(s)					M&S Dev																											
Concept Prototype Build	1				Concept Prototype Build																											
Concept Prototype Test and Evaluation					Concept Prototype T&E																											
Analysis of Alternatives	AoA																															
Material Solution Analysis					Material Solution Analysis																											
Bomb Unit Alternative Study													Bomb Unit Alternative Study																			
(2) Milestone A													2 MS A																			
(3) Technology Maturation and Risk Reduction Agreements Award(s)																	3 Contract Award(s)															
Technology Maturation and Risk Reduction (TMRR)																	TMRR															

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603619A / <i>Landmine Warfare and Barrier - Adv Dev</i>	Project (Number/Name) EK7 / <i>Area Denial Capability Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Model and Simulation Development	1	2016	1	2019
Concept Prototype Agreements Award(s)	2	2016	2	2016
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	2017
Bomb Unit Alternative Study	3	2018	4	2019
Milestone A	3	2018	3	2018
Technology Maturation and Risk Reduction Agreements Award(s)	2	2019	2	2019
Technology Maturation and Risk Reduction (TMRR)	2	2019	2	2024

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603627A / <i>Smoke, Obscurant and Target Defeating Sys-Adv Dev</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	12.894	44.264	7.135	-	7.135	6.166	0.000	0.000	0.000	0.000	70.459
E79: <i>SMOKE/OBSCURANT SYSTEM</i>	-	12.894	44.264	7.135	-	7.135	6.166	0.000	0.000	0.000	0.000	70.459

Note
 Nuclear Biological Chemical Radiological Vehicle Sensor Suite (NBCRVSS) funding moves to a separate Program Element starting in FY18. It will be reflected under PE 655038, Project Code EQ7.

A. Mission Description and Budget Item Justification
 Screening Obscuration Module (SOM): US Forces must be able to effectively neutralize and degrade energy weapon systems and electro-optical systems/smart weapons that operate in the full range of the electromagnetic spectrum to improve platform survivability and soldier protection levels of maneuver forces on the battlefield. Improvements are sought across the entire multi-spectral range from visual through infrared (IR) and millimeter wavelengths (MMW) radar for incorporation into self-protection using sustained generated obscuration technology. SOM will be man portable and modular to facilitate quick mounting on manned/unmanned platforms and dismounted operations.

NBCRV: This program upgrades the Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite (NBCRVSS). The NBCRVSS is the Mission Equipment Package for the Stryker Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) and consists of chemical point detectors, a standoff chemical vapor detector, a biological point detector, a Chemical Vapor Sampling System, and a Sensor Processing Group. The NBCRVSS provides the Stryker NBCRV the ability to detect, identify, collect, report, and mark Nuclear Biological Chemical (NBC) Hazards. Starting in FY16, a Chemical Surface Detector will be developed to replace the Dual Wheel Sampling System to increase maneuverability of the Stryker NBCRV and increase reliability. Starting in FY17, a Chemical Mass Spectrometer will be developed to replace the Chemical Biological Mass Spectrometer Block II to increase reliability, sensitivity, and the number of chemicals detected. Also in FY17 an update to the Joint Service Lightweight Standoff Chemical Agent Detector (JLSCAD) will be developed to increase range and probability of detection by reducing its field of view. FY18 funds and program details are reflected under PE 655038, Project Code EQ7.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603627A / <i>Smoke, Obscurant and Target Defeating Sys-Adv Dev</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	13.426	28.244	7.137	-	7.137
Current President's Budget	12.894	44.264	7.135	-	7.135
Total Adjustments	-0.532	16.020	-0.002	-	-0.002
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.532	-			
• Adjustments to Budget Years	0.000	16.020	-0.002	-	-0.002

Change Summary Explanation

FY 2017 increase (\$16.020M) is attributable to various program efforts, primarily in NBCRV: Sensor Suite Upgrade Development and SOM: Product Development.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603627A / <i>Smoke, Obscurant and Target Defeating Sys-Adv Dev</i>				Project (Number/Name) E79 / <i>SMOKE/OBSCURANT SYSTEM</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
E79: <i>SMOKE/OBSCURANT SYSTEM</i>	-	12.894	44.264	7.135	-	7.135	6.166	0.000	0.000	0.000	0.000	70.459
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Screening Obscuration Module (SOM): US Forces must be able to effectively neutralize and degrade energy weapon systems and electro-optical systems/smart weapons that operate in the full range of the electromagnetic spectrum to improve platform survivability and soldier protection levels of maneuver forces on the battlefield. Improvements are sought across the entire multi-spectral range from visual through infrared (IR) and millimeter wavelengths (MMW) radar for incorporation into self-protection using sustained generated obscuration technology. SOM will be man portable and modular to facilitate quick mounting on manned/unmanned platforms and dismounted operations.

NBCRV: This program upgrades the Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite (NBCRVSS). The NBCRVSS is the Mission Equipment Package for the Stryker Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) and consists of chemical point detectors, a standoff chemical vapor detector, a biological point detector, a Chemical Vapor Sampling System, and a Sensor Processing Group. The NBCRVSS provides the Stryker NBCRV the ability to detect, identify, collect, report, and mark Nuclear Biological Chemical (NBC) Hazards. Starting in FY16, a Chemical Surface Detector will be developed to replace the Dual Wheel Sampling System to increase maneuverability of the Stryker NBCRV and increase reliability. Starting in FY17, a Chemical Mass Spectrometer will be developed to replace the Chemical Biological Mass Spectrometer Block II to increase reliability, sensitivity, and the number of chemicals detected. Also in FY17 an update to the Joint Service Lightweight Standoff Chemical Agent Detector (JLSCAD) will be developed to increase range and probability of detection by reducing its field of view. FY18 funds and program details are reflected under PE 655038, Project Code EQ7.

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

	FY 2016	FY 2017	FY 2018
Title: SOM: Product Development	1.210	21.120	4.400
Description: Provide SOM Development			
FY 2016 Accomplishments: SOM: Initiated design and development of the SOM system.			
FY 2017 Plans: SOM: Continue design and development of the SOM system.			
FY 2018 Plans: SOM: Continue design and development of the SOM system.			
Title: SOM: Test, Evaluation & OGA's	0.251	0.800	1.612

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603627A / <i>Smoke, Obscurant and Target Defeating Sys-Adv Dev</i>	Project (Number/Name) E79 / <i>SMOKE/OBSCURANT SYSTEM</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Description: Provide Test and Evaluation of SOM systems</p> <p>FY 2016 Accomplishments: SOM: Initiated test and evaluation planning and fund other government agencies (OGA's)</p> <p>FY 2017 Plans: SOM: Continue test and evaluation planning.</p> <p>FY 2018 Plans: SOM: Continue test and evaluation planning and fund other government agencies (OGA's)</p>				
<p>Title: SOM: Project Management</p> <p>Description: Provide Project Management</p> <p>FY 2016 Accomplishments: SOM: Initiated Government program management, systems engineering, and Integrated Product Team (IPT) support.</p> <p>FY 2017 Plans: SOM: Continue Government program management, systems engineering, and Integrated Product Team (IPT) support.</p> <p>FY 2018 Plans: SOM: Continue Government program management, systems engineering, and Integrated Product Team (IPT) support.</p>		1.125	1.125	1.123
<p>Title: NBCRV: Sensor Suite Upgrade Development</p> <p>Description: Provide Sensor suite upgrade development</p> <p>FY 2016 Accomplishments: NBCRV: Initiated task orders for sensor suite development.</p> <p>FY 2017 Plans: NBCRV: Continue sensor suite upgrade development</p>		7.861	17.019	-
<p>Title: NBCRV Integration Support</p> <p>Description: Provide ILS and Integration support to the sensor suite upgrades</p> <p>FY 2017 Plans:</p>		-	0.700	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603627A / <i>Smoke, Obscurant and Target Defeating Sys-Adv Dev</i>	Project (Number/Name) E79 / <i>SMOKE/OBSCURANT SYSTEM</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
NBCRV: Continue ILS and Integration support to the sensor suite upgrades				
Title: NBCRV: Test & Evaluation		0.571	1.500	-
Description: Provide NBCRV testing of prototypes				
FY 2016 Accomplishments: NBCRV: Initiated test and evaluation planning and support for sensor suite upgrade prototypes.				
FY 2017 Plans: NBCRV: Continue test and evaluation planning and support for sensor suite upgrade prototypes				
Title: NBCRV: Project Management		1.876	1.800	-
Description: Provide NBCRV Project Management Labor				
FY 2016 Accomplishments: NBCRV: Initiated government program management, systems engineering, and Integrated Product Team (IPT) support.				
FY 2017 Plans: NBCRV: Continue government program management, systems engineering, and Integrated Product Team (IPT) support.				
Title: CRESS: Engineering Studies		-	0.200	-
Description: Chemical Reconnaissance and Explosives Screening Set (CRESS)				
FY 2017 Plans: CRESS: Initiate engineering studies				
Accomplishments/Planned Programs Subtotals		12.894	44.264	7.135
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
Acquisition Strategy:				
Screening Obscuration Module (SOM): The SOM acquisition strategy is a single-step System Integration and Development (SID) phase leading to a Milestone C production decision. A Full and Open Cost Plus Incentive Fee competitive contract will be used to develop the SOM during the SID phase. Fixed Price Incentive				

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army Date: May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603627A / <i>Smoke, Obscurant and Target Defeating Sys-Adv Dev</i>	Project (Number/Name) E79 / <i>SMOKE/OBSCURANT SYSTEM</i>
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(Successive Targets) options for production will be included in the contract. The acquisition strategy includes system development and demonstration, full system integration, design for producibility and demonstration of interoperability, safety, military utility and reliability.

Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite (NBCRVSS) Upgrade is a single-step in the evolutionary acquisition strategy for the Stryker Nuclear Biological Chemical Reconnaissance Vehicle. The contract approach of the Chemical Surface Detector (CSD) will be a Full and Open Cost Plus Fixed Fee competitive prototyping contract. The contract approach of the Chemical Mass Spectrometer (CMS) will be a Full and Open Cost Plus Fixed Fee competitive prototyping contract. The contract approach for the update of the Joint Service Lightweight Standoff Chemical Agent Detector (JSLSCAD) will be a Sole Source Cost Plus Fixed Fee Indefinite Delivery Indefinite Quantity with Firm Fixed Price production task orders.

E. Performance Metrics

N/A

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army											Date: May 2017	
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 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	42.272	42.096	41.452	-	41.452	42.209	25.451	10.054	6.354	Continuing	Continuing
656: 120mm Cartridge (Advanced Multipurpose-AMP)	-	26.485	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	26.485
694: Medium Caliber Ammunition	-	0.000	2.170	1.000	-	1.000	6.200	2.400	0.000	0.000	0.000	11.770
EB8: OWL for Small Caliber Ammunition	-	2.001	2.166	1.200	-	1.200	2.200	2.000	0.000	0.000	Continuing	Continuing
EB9: Tunable Pyrotechnic Aircraft Countermeasure Flares	-	1.662	2.368	1.000	-	1.000	1.600	0.000	0.000	2.600	0.000	9.230
EC2: Adv Armor-Piercing (ADVAP) for Small Cal Ammo	-	7.395	0.000	0.000	-	0.000	3.800	6.900	0.000	0.000	Continuing	Continuing
EC3: Ammunition Logistics Prototyping	-	3.430	2.017	1.677	-	1.677	2.209	2.151	2.054	3.754	0.000	17.292
EL7: Reduced Range Ammunition	-	0.000	2.166	7.600	-	7.600	7.700	0.000	0.000	0.000	Continuing	Continuing
EL8: LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER	-	1.299	1.280	2.500	-	2.500	0.000	0.000	0.000	0.000	0.000	5.079
EU1: Enhanced Lethality Cannon Munitions	-	0.000	9.866	10.000	-	10.000	0.000	0.000	0.000	0.000	0.000	19.866
EU2: Improved Multi-Option Fuze (iMOFA/iMOFM)	-	0.000	7.892	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.892
FA5: Assured Precision Weapons and Munitions	-	0.000	10.171	13.000	-	13.000	15.000	12.000	8.000	0.000	Continuing	Continuing
FG1: Cannon-Delivered Area Effects Munitions (C-DAEM)	-	0.000	2.000	1.000	-	1.000	0.000	0.000	0.000	0.000	0.000	3.000
XT5: 30mm Anti-Personnel and Counter UAS	-	0.000	0.000	2.475	-	2.475	3.500	0.000	0.000	0.000	Continuing	Continuing

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	
Note In FY 2018, PE 0603639A Project XT5 is a new start program.		
A. Mission Description and Budget Item Justification The Tank and Medium Caliber Ammunition 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 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' 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 M829A4 cartridge that achieved Milestone C in FY 2014 and achieved Full Materiel Release in FY 2015. FY 2016 supported multiple contracts with competing prototypes in Phase 1 of 2 for Engineering and Manufacturing Development (EMD). Project 694: Joint Light Tactical Family of Vehicles (FoV): Develop and qualify 30x113mm ammunition for the Joint Light Tactical Vehicle (JLTV) which will serve as the Infantry Brigade Combat Team Light Reconnaissance Vehicle (RV). This is an Army directed requirement to enhance the operational effectiveness of the JLTV-RV by increasing precision and lethality capability to defeat personnel and material targets using a 30x113mm weapon system. Qualify the linked M788 and M789 ammunition and develop airburst capable munitions for use with the Light Weight 30mm Link Fed Chain Gun. The HEAB cartridge will be developed through a competitive Engineering and Manufacturing Development (EMD) program. As part of the pre-EMD activities, Cooperative Research and Development Agreement (CRADA) Testing with contractors will occur to evaluate potential designs. For EMD, two Full and Open competitive contracts will be awarded. After Developmental Test & Evaluation (DT&E) the government will down-select to a single contractor for Low Rate Initial Production (LRIP) and two production year options. Project EB8: The One Way Luminescence (OWL) program is a critical technology development in response to the 7.62mm and 5.56mm Families 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's objective is to develop and field a full day/night tracer round to 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 OWL cartridges. FY 2018 funding supports finalizing 7.62mm concept development. FY 2018 funding also supports maturing the 5.56mm OWL technology, procuring bullet components, tracer material and testing evaluation in order to attain a Technology Level Readiness (TRL) of 6 in FY 2020; and support of Engineering and Manufacturing Development (EMD) contract development necessary for a FY 2021 Milestone B (MS B).		

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	
<p>Project EB9: The Tunable Pyrotechnic Aircraft Countermeasure Flares program supports the advanced development activities and technology demonstrations of the Aviation Airborne Expendable Countermeasure (AAECM). These advanced decoys are necessary to address emerging threats and capabilities 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. Prototypes will help expedite technology transition from the laboratory to operational use by demonstrating 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.</p> <p>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 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.</p> <p>Project EC3: The Ammunition Logistics Prototyping program 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. FY2018 dollars will support the completion of system component integration and verification testing and operational demonstration for the environmental health monitoring system, the completion of prototype development and verification testing of a next generation temperature/humidity sensor, and the maturation of the design and fabrication of prototype plastic polymer rectangular containers for developmental 5.56mm ammunition.</p> <p>Project EL7: The small caliber Reduced Range Ammunition (RRA) program is a critical technology development in response to the 7.62mm and .50 caliber Capabilities Development Documents (CDD). The overall objective of RRA is to provide training ammunition suitable for use on military installations with Surface Danger Zone (SDZ) restrictions. The relatively long maximum range of the 7.62mm and .50 caliber service ammunition poses challenges on training ranges in range restricted areas. RRA will mitigate a training gap on installations by providing a materiel solution that meets training needs while shortening and condensing the SDZ. This will allow soldiers to train with 7.62mm and .50 caliber weapons on restricted ranges. The RRA cartridge design will be compatible with all Army 7.62mm and .50 caliber weapons, but specifically optimized to work in the M240 and M2 Machine Guns. FY 2018 dollars support Technology Maturation and Risk Reduction in preparation for a 7.62mm TRL 6 demonstration and preparation for Milestone B (MS-B). Leverage lessons learned from Marine Corp .50 Caliber Reduced Range Ammunition effort. Purchase test articles and perform engineering tests to qualify the .50 Caliber Marine Corps design/ammunition for Army use.</p> <p>Project EL8: The Lightweight Small Caliber Ammunition (LSCA) program is a critical technology development in response to the 7.62mm 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</p>		

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	
<p>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. FY 2018 funding will support the development of the preliminary lightweight cartridge design to include a Systems Requirement Review, Preliminary Design Review, and manufacturing of Pre-Validation Test Samples.</p> <p>Project EU1: The Enhanced Lethality Cannon Munitions (ELCM) project will evaluate, develop, mature, and demonstrate new lethality technologies for 155mm cannon artillery munitions and evaluate their effectiveness in mitigating evolving and derived capability gaps, and support transition to Engineering Manufacturing Development (EMD). The ELCM project will prototype and accelerate the maturation of enhanced lethality technologies, such as Lithographic Fragmentation Technology (LFT), for 155mm cannon artillery munition. The ELCM project will accelerate the development and maturation of LFT for subsequent integration on the 155mm XM1128 high explosive projectile per HQDA G-8 Directed Requirement for a Rapid Bridging Solution for the 155mm Dual Purpose Improved Conventional Munition, 22 December 2016. ELCM addresses requirements for increased lethality above the current U.S. Army go-to-war 155mm high explosive unitary projectiles, the M795 Insensitive Munition. FY 2018 funding will support prototyping of enhanced lethality technologies applicable to 155mm cannon artillery munitions.</p> <p>Project EU2: The Improved Multi-Option Fuze (iMOFA/iMOFM) project will identify, develop, prototype, and demonstrate new improved multi-option fuze technologies, components, and subsystems based on Government-owned 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 project will support technology maturation and risk reduction, and will evaluate and analyze producibility, affordability, safety, and compatibility of these prototype potential materiel solutions in representative realistic performance-related developmental tests. Up to four potential NGPS with built-in DEF technology prototype solutions for improved multi-option fuzing systems from Government and/or Industry will be prototyped and evaluated. This project will enable fact-based analysis of new Government-owned 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.</p> <p>Project FA5: The Assured Precision Weapons and Munitions project is a continuation of FY14-16 efforts initiated under 644120A-ED5. 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 FY2018 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. FY 2018 funding will support requirements for MGUE Increment 2 and Pseudolite related technology maturity for Assured PNT Milestone decisions, analysis and evaluation of 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, including specific focus on Pseudolite related weapons and munitions integration risk mitigation and</p>		

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>
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Emplaced Weapon Use-Case needed for Precision Fires, and development, prototyping, and evaluation of new/emerging Assured PNT capabilities (including M-Code GPS and Pseudolites) for PGK, M777A2, and M119A3 when operating in a complex heterogeneous system-of-systems environment, and continue prototyping/evaluation in support of a subsequent M-Code/Pseudolite capable setter.

Project FG1: The Cannon-Delivered Area Effects Munitions (C-DAEM) project will analyze, identify, develop, prototype, and demonstrate 155mm Cannon Artillery munition area effects capability. C-DAEM are envisioned as a suite of 155mm artillery munitions, to provide U.S. ground forces with a capability to effectively engage area targets to destroy, neutralize, and/or suppress threat platforms and facilities, and deny threat forces full operational freedom within the targeted area. Initial objective values for C-DAEM would meet Dual Purpose Improved Conventional Munitions (DPICM) effects capabilities against personnel and light vehicles and exceed DPICM effects capabilities against armor. An Analysis of Alternatives (AoA) will be completed to best inform necessary area effect lethality requirements. The project addresses requirements from the U.S. Army adopted U.S. Marine Corps (USMC) C-DAEM Initial Capabilities Document (ICD) [AROC adopted 20 October 2016, JROC approved 11 May 2016]. The approved C-DAEM ICD as an Army requirement is located in the Capabilities and Army Requirements Documents number 0438. The Joint Staffing Designator is Joint Requirement Oversight Council (JROC) Interest. FY 2018 funding will support the completion of the C-DAEM AoA to inform C-DAEM required capabilities and the Milestone A review with MDA.

Project XT5: Lightweight 30mm x 113mm (LW30) Airburst ammunition is a new capability identified as a Warfighter requirement. The LW30 airburst cartridge improves the warfighter's probability in defeating anti-personnel and anti-materiel targets due to increased lethality. Airburst capability allows a much higher probability of achieving a first burst kill against enemy personnel targets in the open. The LW30 will retain its dual purpose warhead, allowing it to continue to defeat light armored threats through point detonation. The cartridge provides increased lethal effects against personnel & soft-skin vehicular targets increasing Soldier Survivability while troops are in contact engagements and decreases the required number of rounds to reach the desired lethal effects. FY 2018 supports Technology Maturation and Risk Reduction effort.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	46.749	40.096	46.663	-	46.663
Current President's Budget	42.272	42.096	41.452	-	41.452
Total Adjustments	-4.477	2.000	-5.211	-	-5.211
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-4.477	2.000	-5.211	-	-5.211

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) 656 / 120mm Cartridge (Advanced Multipurpose-AMP)			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
656: 120mm Cartridge (Advanced Multipurpose-AMP)	-	26.485	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	26.485
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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 M829A4 cartridge that achieved Milestone C in FY 2014 and achieved Full Materiel Release in FY 2015. FY 2016 supported multiple contracts with competing prototypes in Phase 1 of 2 for Engineering and Manufacturing Development (EMD).

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

	FY 2016	FY 2017	FY 2018
Title: Phase I Engineering and Manufacturing Development (EMD)	26.485	-	-
Description: Develop, demonstrate and qualify the AMP 120mm large caliber munition.			
FY 2016 Accomplishments: Preliminary Design Review occurred in 3Q FY 2016. Designed, built and delivered prototype hardware for cartridge demonstration and initiated shoot off testing.			
Accomplishments/Planned Programs Subtotals	26.485	-	-

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• AMP (PE / Project: 0604802A / ED7): 120mm Cartridge (Advanced Multipurpose-AMP)	-	31.215	31.655	-	31.655	28.018	-	-	-	0	90.888
• AMP (SSN: E88105): 120mm Cartridge (Advanced Multipurpose-AMP)	-	-	-	-	-	25.000	30.000	40.000	48.000	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) 656 / <i>120mm Cartridge (Advanced Multipurpose-AMP)</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

D. Acquisition Strategy

The AMP Program achieved Milestone B and entered EMD in FY 2015. EMD consists of two phases; Phase 1 awarded two contracts in FY 2015 to competitively prototype. A cartridge demonstration test was conducted and was used to support downselect to a single contractor for EMD Phase 2, which will lead to Milestone C in 2019 followed by two Low Rate Initial Productions in FY 2019 and FY 2020 and one optional year of full procurement in FY 2021. Explore options to increase future competition.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) 694 / Medium Caliber Ammunition			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
694: Medium Caliber Ammunition	-	0.000	2.170	1.000	-	1.000	6.200	2.400	0.000	0.000	0.000	11.770
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program 0603639A 694 / Medium Caliber Ammunition funds the 40mm Low Velocity High Explosive Air Burst (HEAB), XM1166 effort in FY 2017 and the ammunition improvements for the Joint Light Tactical Family of Vehicles (FoV) program beginning in FY 2018. The 40mm Low Velocity High Explosive Air Burst (HEAB), XM1166 effort will transition to Program 0604802A EW1 in FY 2018.

A. Mission Description and Budget Item Justification

Joint Light Tactical Family of Vehicles (FoV): Develop and qualify 30x113mm ammunition for the Joint Light Tactical Vehicle (JLTV) which will serve as the Infantry Brigade Combat Team Light Reconnaissance Vehicle (RV). This is an Army directed requirement to enhance the operational effectiveness of the JLTV-RV by increasing precision and lethality capability to defeat personnel and material targets using a 30x113mm weapon system. Qualify the linked M788 and M789 ammunition and develop airburst capable munitions for use with the Light Weight 30mm Link Fed Chain Gun.

High Explosive Air Burst (HEAB) is a new capability identified as a Warfighter requirement in the Capability Development Document (CDD), 40mm Low Velocity (LV) Family of Ammunition Annex. The 40mm LV HEAB tactical cartridge allows the warfighter to effectively engage targets at increased ranges using the 40mm M203/M320 Grenade Launchers. The HEAB cartridge provides the grenadier with a higher probability of achieving a first shot kill against enemy personnel, coupled with the ability to defeat personnel targets in defilade positions at increased ranges with greater accuracy and lethality. When deployed against point and area targets, the cartridge inflicts incapacitating effects against personnel at increased ranges beyond those offered by the current M433 High Explosive Dual Purpose (HEDP) cartridge. The cartridge provides lethal effects against targets with improved accuracy and greater standoff ranges increasing Soldier Survivability.

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

	FY 2016	FY 2017	FY 2018
Title: Test and Evaluation of linked 30x113mm for Suite of Ammunition for Joint Light Tactical FoV	-	-	1.000
Description: Linked 30x113mm Ammunition Qualification for New Weapon and Vehicle Applications			
FY 2018 Plans: FY 2018 funds will be used to update linked 30x113mm ammunition Technical Data Packages (TDPs), purchase ammunition links, and contract to link M788 and M789 cartridges. Linked ammunition deliveries will be synchronized to support ammunition/link/weapon qualification activities.			
Title: Pre Engineering Manufacturing Development Activities for the 40mm HEAB XM1166	-	2.170	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) 694 / <i>Medium Caliber Ammunition</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Description: Pre-award activities need to be accomplished prior to start of EMD.			
FY 2017 Plans: FY 2017 supports Milestone B activities and contract preparation.			
Accomplishments/Planned Programs Subtotals	-	2.170	1.000

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0604802A EW1: <i>40mm High Explosive Air Burst (HEAB) XM1166</i>	-	0.353	9.678	-	9.678	13.412	14.195	21.553	1.500	Continuing	Continuing

Remarks
40mm High Explosive Air Burst (HEAB), XM1166, effort transitions to 0604802A EW1 in FY 2018.

D. Acquisition Strategy
Joint Light Tactical FoV: Solicit responses from industry to the government's detailed Technical Data Packages (TDPs) under an existing Indefinite Delivery/Indefinite Quantity (IDIQ) contract. Linked ammunition deliveries to Aberdeen Proving Ground (APG) will be synchronized with test schedules for ammunition/weapon qualification and Remote Weapon Station (RWS)/vehicle integration. Begin preparation activities for ammunition qualification tests and weapon qualification tests in FY 2018. In addition, begin preparation activities for initial effort to develop an airburst capable munition for the JLTV FoV.

The HEAB cartridge will be developed through a competitive Engineering and Manufacturing Development (EMD) program. As part of the pre-EMD activities, Cooperative Research and Development Agreement (CRADA) Testing with contractors will occur to evaluate potential designs. For EMD, two Full and Open competitive contracts will be awarded. After Developmental Test & Evaluation (DT&E) the government will down-select to a single contractor for Low Rate Initial Production (LRIP) and two production year options.

E. Performance Metrics
N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) EB8 / OWL for Small Caliber Ammunition			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EB8: OWL for Small Caliber Ammunition	-	2.001	2.166	1.200	-	1.200	2.200	2.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The small caliber One Way Luminescence (OWL) technology applies to multiple calibers. In FY 2018 the 7.62mm OWL program transitions from 0603639A EB8 to 0604802A EP4; the program is not a new start. 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. As the technology matures the project transitions to Project 0654802A EP4 starting in FY 2018 for 7.62mm, and FY 2021 for 5.56mm. 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 and 5.56mm Families 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's objective is to develop and field a full day/night tracer round to 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 OWL cartridges. FY 2018 funding supports finalizing 7.62mm concept development. FY 2018 funding also supports maturing the 5.56mm OWL technology, procuring bullet components, tracer material and testing evaluation in order to attain a Technology Level Readiness (TRL) of 6 in FY 2020; and support of Engineering and Manufacturing Development (EMD) contract development necessary for a FY 2021 Milestone B (MS B).

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

	FY 2016	FY 2017	FY 2018
Title: Technology Maturation and Risk Reduction (TMRR)	2.001	2.166	1.200
Description: One Way Luminescence (OWL) will develop and demonstrate a full day/night tracer technology that eliminates the shortcomings of current legacy tracers.			
FY 2016 Accomplishments: FY 2016 continued with concurrent Government and Contractor efforts to mature technology readiness level in 7.62mm. The efforts included development, procurement, and testing of multiple competing prototype solutions to reduce risk in meeting user requirements. TRL 4 was demonstrated.			
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EB8 / <i>OWL for Small Caliber Ammunition</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
FY 2017 efforts will include 7.62mm prototype evaluation in preparation for MS B. EMD contract development will occur in preparation for contact award. TRL 6 will be demonstrated.			
<i>FY 2018 Plans:</i> FY 2018 activities include: 7.62mm concept development and maturing the 5.56mm Technology Readiness Level (TRL). The 5.56mm efforts include development, procurement, and testing of multiple competing prototype solutions to reduce risk in meeting user requirements.			
Accomplishments/Planned Programs Subtotals	2.001	2.166	1.200

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PE 0604802A Project EP4: <i>OWL for Small Caliber Ammunition</i>	-	-	2.688	-	2.688	5.698	6.002	11.891	6.400	Continuing	Continuing

Remarks
The OWL technology will be integrated into the M80A1 trace ammunition production. 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. The 0604802A EP4 OWL funding line continues the development work of 7.62mm OWL cartridges into Engineering and Manufacturing Development (EMD). EMD work for the 5.56mm cartridges begins in FY 2021.

D. Acquisition Strategy
The OWL concept will be developed through Government and Industry prototyping efforts. A Technology Readiness Assessment (TRA) was conducted in FY 2015 and FY 2016 to measure the progress of the designs. An additional TRA is being conducted in FY 2017. The FY 2017 TRA is conducted to evaluate the industry and Government concepts in order to proceed with Engineering and Manufacturing Development (EMD). The Government plans to demonstrate TRL 6 for 7.62mm in FY 2017 to prepare for Milestone B achievement in FY 2018. The 5.56mm cartridges will follow the 7.62mm schedule with Engineering and Manufacturing Development (EMD) starting in FY 2021. The 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-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
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			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EB9: Tunable Pyrotechnic Aircraft Countermeasure Flares	-	1.662	2.368	1.000	-	1.000	1.600	0.000	0.000	2.600	0.000	9.230
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project is to support the advanced development activities and technology demonstrations of the Aviation Airborne Expendable Countermeasure (AAECM). These advanced decoys are necessary to address emerging threats and capabilities 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. Prototypes will help expedite technology transition from the laboratory to operational use by demonstrating 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. FY2018 Funding is to develop and prepare documentation for Milestone A decision for the Radar Guided decoy. This decoy is designed to defeat specific threat types. Details of their operation is classified. Conduct initial developmental/operational testing on Cloud CM

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

	FY 2016	FY 2017	FY 2018
Title: Expendable Countermeasures to Guided Missile Threats	1.662	2.368	1.000
Description: This program will develop expendable countermeasure (CM) decoys which will protect Army aircraft from surface-to-air missiles.			
FY 2016 Accomplishments: Prepare necessary documents to support Material Development Decision (MDD).			
FY 2017 Plans: Develop and prepare documentation for Materiel Development Decision (MDD) approval and prepare documentation to support Milestone Decision (MS A) for the Cloud CM. This decoy is designed to defeat specific threat types. Details of their operation is classified. Conduct initial developmental testing on Cloud CM.			
FY 2018 Plans: Develop and prepare documentation for Milestone A decision for the Radar Guided decoy. This decoy is designed to defeat specific threat types. Details of their operation is classified. Conduct initial developmental/operational testing on Cloud CM.			
Accomplishments/Planned Programs Subtotals	1.662	2.368	1.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EB9 / <i>Tunable Pyrotechnic Aircraft Countermeasure Flares</i>

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

Line Item	FY 2016	FY 2017	FY 2018	FY 2018	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Cost To	Total Cost
			Base	OCO	Total					Complete	
• 0604802A - Weapons and Munitions -: <i>EP7 - Tunable Pyrotechnic Aircraft Countermeasure Flares</i>	-	1.450	7.500	-	7.500	7.300	5.800	-	16.400	0.000	38.450

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 3QFY17

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) EC2 / Adv Armor-Piercing (ADVAP) for Small Cal Ammo			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EC2: Adv Armor-Piercing (ADVAP) for Small Cal Ammo	-	7.395	0.000	0.000	-	0.000	3.800	6.900	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The small caliber Advanced Armor-Piercing (ADVAP) technology applies to multiple calibers. In FY 2017, the 7.62mm ADVAP transitions to PE 0604802A.

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 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)

	FY 2016	FY 2017	FY 2018
Title: Technology Maturation & Risk Reduction (TMRR)	7.395	-	-
Description: Develop, demonstrate, and qualify XM1158 Small Caliber Ammo 7.62mm ADVAP cartridges in order to defeat threat targets and provide overmatch capability versus a broad spectrum of hard targets.			
FY 2016 Accomplishments: FY 2016 work included 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. Demonstrated Technology Readiness Level (TRL) 6. Funding also supported preparation for MS-B.			
Accomplishments/Planned Programs Subtotals	7.395	-	-

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PE 0604802A Project EP5: Advanced Armor-Piercing (ADVAP) for Small Cal Ammunition	-	10.270	11.571	-	11.571	12.887	1.804	7.297	7.000	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) 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 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks
This funding line continues the development work of both 7.62mm and 5.56mm ADVAP cartridges into Engineering & Manufacturing Development (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, accomplished design optimization, manufactured prototypes, and demonstrated TRL 6 for XM1158. Milestone B (MS-B) occurred in 1st Quarter FY 2017 leading to fabrication and testing of qualification hardware. The 5.56mm cartridge, starting in FY 2019, will follow a similar strategy as the 7.62mm.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) EC3 / Ammunition Logistics Prototyping			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EC3: Ammunition Logistics Prototyping	-	3.430	2.017	1.677	-	1.677	2.209	2.151	2.054	3.754	0.000	17.292
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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. FY2018 funding used to complete system component integration and conduct verification testing and an operational demonstration for the environmental health monitoring system. Complete prototype development and verification testing of a next generation temperature/humidity sensor with batch interrogation and historical data retention capabilities, which will be used for assessing munitions reliability.

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

	FY 2016	FY 2017	FY 2018
Title: Munitions Health and Inventory Monitoring Systems	1.390	0.722	1.177
Description: 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.			
FY 2016 Accomplishments: Conducted operational testing and modified design of a passive time/temperature exposure sensor that aids in assessing munitions reliability. Completed requirements evaluation for an ammunition packaging mounted environmental health monitoring system that will facilitate improved ammunition management.			
FY 2017 Plans: Fabricate environmental health monitoring system prototypes and conduct engineering testing. Conduct correlation testing on the passive time/temperature exposure sensor with additional ammunition items.			
FY 2018 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EC3 / <i>Ammunition Logistics Prototyping</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
Complete system component integration and conduct verification testing and an operational demonstration for the environmental health monitoring system. Complete prototype development and verification testing of a next generation temperature/humidity sensor with batch interrogation and historical data retention capabilities, which will be used for assessing munitions reliability.				
<p>Title: Munitions Containerization Systems</p> <p>Description: 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>FY 2016 Accomplishments: blank</p> <p>FY 2017 Plans: Complete fabrication and prototype verification testing of the lightweight plastic polymer cylindrical ammunition container.</p> <p>FY 2018 Plans: Mature design and fabricate prototype plastic polymer rectangular containers for developmental 5.56mm ammunition.</p>		0.518	0.812	0.500
<p>Title: Insensitive Munitions (IM) Integration</p> <p>Description: 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 unplanned stimuli such as fire, fragments, enclosed heat build-up (cook-off), bullets, adjacent munitions reaction (sympathetic detonation), and shape charge jet attacks.</p> <p>FY 2016 Accomplishments: Developed Insensitive Munitions (IM) high output booster explosives to replace booster materials in fuzes, supplemental and auxiliary charges, and main fills for medium caliber munitions. Developed less sensitive IM propellants for mortar and tank munitions. Implemented warhead venting technology for the 120mm high energy warhead.</p> <p>FY 2017 Plans: Demonstrate booster energetics in medium caliber munitions and boosters. Implement container seam venting technologies into 120mm mortar packaging containers. Test new packaging and internal dunnage materials to actively attract or pull heat away from vulnerable munition components in case of fire.</p>		1.522	0.483	-
Accomplishments/Planned Programs Subtotals		3.430	2.017	1.677

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) EC3 / Ammunition Logistics Prototyping

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) EL7 / Reduced Range Ammunition			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EL7: Reduced Range Ammunition	-	0.000	2.166	7.600	-	7.600	7.700	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The small caliber Reduced Range Ammunition (RRA) technology applies to multiple calibers. As the technology matures the program will transition to Project 0604802A EP3 in FY 2019 for 7.62mm and FY 2020 for .50 caliber ammunition.

A. Mission Description and Budget Item Justification

The small caliber Reduced Range Ammunition (RRA) program is a critical technology development in response to the 7.62mm and .50 caliber Capabilities Development Documents (CDD). The overall objective of RRA is to provide training ammunition suitable for use on military installations with Surface Danger Zone (SDZ) restrictions. The relatively long maximum range of the 7.62mm and .50 caliber service ammunition poses challenges on training ranges in range restricted areas. RRA will mitigate a training gap on installations by providing a materiel solution that meets training needs while shortening and condensing the SDZ. This will allow soldiers to train with 7.62mm and .50 caliber weapons on restricted ranges. The RRA cartridge design will be compatible with all Army 7.62mm and .50 caliber weapons, but specifically optimized to work in the M240 and M2 Machine Guns. FY 2018 dollars support Technology Maturation and Risk Reduction in preparation for a 7.62mm TRL 6 demonstration and preparation for Milestone B (MS-B). Leverage lessons learned from Marine Corp .50 Caliber Reduced Range Ammunition effort. Purchase test articles and perform engineering tests to qualify the .50 Caliber Marine Corps design/ammunition for Army use.

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

	FY 2016	FY 2017	FY 2018
Title: Technology Maturation and Risk Reduction (TMRR)	-	2.166	7.600
Description: Develop, demonstrate, and qualify a small caliber Reduced Range Ammunition (RRA) 7.62mm and .50 caliber ammunition capability that will provide a reduced range training capability to the M240 and M2 gunner.			
FY 2017 Plans: Mature development and demonstrate (TRL6) 7.62mm Ball and Trace RRA cartridges. Conduct Materiel Development Decision (MDD) and MS-B preparations.			
FY 2018 Plans: Conduct System Requirements Review (SRR) and perform MS-B preparation activities for 7.62mm. Mature development and demonstrate (TRL6) .50 Cal Ball and Trace RRA cartridges and conduct Materiel Development Decision (MDD), System Requirements Review (SRR), and MS-B preparation. Purchase test articles to begin efforts to qualify the .50 Caliber Marine Corps design/ammunition for Army use.			
Accomplishments/Planned Programs Subtotals	-	2.166	7.600

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EL7 / <i>Reduced Range Ammunition</i>

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2018</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• PE 0604802A Project EP3: <i>Reduced Range Ammunition - Small Caliber</i>	-	-	-	-	-	2.500	10.000	15.500	10.000	Continuing	Continuing

Remarks

The 0604802A EP3, Reduced Range Ammunition - Small Caliber, program will not be a new start. Funds in this program in FY 2019 are a realignment of funds from program 0603639A EL7, RRA. The 0604802A EP3, RRA funding line continues the development work of 7.62mm and supports Engineering and Manufacturing Development (EMD) in FY 2019.

D. Acquisition Strategy

The Government will award a competitive contract for 7.62mm Pre-Production Qualification Testing (PPQT) hardware in FY 2020. After 7.62mm MS-B in FY 2019, the Government intends to award an EMD contract. The .50 Caliber program will follow a similar strategy starting in FY 2018. After .50 Caliber RRA MS-B in FY 2020, the Government intends to award a competitive EMD contract.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) EL8 / LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EL8: LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER	-	1.299	1.280	2.500	-	2.500	0.000	0.000	0.000	0.000	0.000	5.079
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Lightweight Cartridge Case small caliber technology will be applied to multiple calibers. The project involves developing and qualifying lightweight cartridge case, starting with 7.62mm ammunition, to replace current brass cartridge case.

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 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. FY 2018 funding will support the development of the preliminary lightweight cartridge design to include a Systems Requirement Review, Preliminary Design Review, and manufacturing of Pre-Validation Test Samples.

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

	FY 2016	FY 2017	FY 2018
Title: 7.62mm Technology Maturation & Risk Reduction (TMRR) for Lightweight Small Caliber Ammunition (LSCA)	1.299	1.280	2.500
Description: Develop, demonstrate, and qualify a Lightweight Small Caliber Ammunition (LSCA) 7.62mm capability that will provide ten to fifty percent ammunition weight savings.			
FY 2016 Accomplishments: Awarded development contracts, received hardware and conducted the M80 polymeric cartridge testing. Hosted an Industry Day for the LSCA Program. Initiated Phase I Industrial Impacts Study with existing Small Caliber Producers to assess the facilitization impacts, manufacturing process, and production risks of transitioning to a lightweight cartridge.			
FY 2017 Plans: Complete Phase II DoD Ordnance Technology Consortium (DOTC) efforts and demonstrate TRL 6 for M80A1 and M62A1 LSCA cartridge deliverables will undergo TRL 6 evaluation. Finalize documentation required for a Full and Open competition by including the information obtained from the Phase II DOTC efforts. Conduct a technology readiness assessment and develop the request for proposal.			
FY 2018 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EL8 / <i>LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Phase II Contractor will develop a preliminary lightweight cartridge design. The Government will complete Systems Requirement Review and Preliminary Design Review then begin Pre-Validation Testing and Limited User Evaluation.			
Accomplishments/Planned Programs Subtotals	1.299	1.280	2.500

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PE 0654802A Project EP6: <i>Lightweight Cartridge Case for Small Caliber Ammunition</i>	-	1.290	-	-	-	-	-	-	2.000	0.000	3.290
• PE 0607131A Project ER6: <i>Direct Fire Technology</i>	-	-	0.855	-	0.855	4.300	0.500	-	-	Continuing	Continuing

Remarks
The funding lines continue work on the 7.62mm ammunition which will transition to PE 0607131A ER6, Direct Fire Technology. The follow-on effort for the .50 Cal will start in FY 2022.

D. Acquisition Strategy
Multiphase development contracts. Phase I and Phase II include development and evaluation of multiple designs/concepts. The Government intends to down-select to one design for Phase III in FY 2019 to manufacture test hardware to support Validation Testing planned for FY 2020. Low Rate Initial Production award will occur in FY 2021.

E. Performance Metrics
N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) EU1 / Enhanced Lethality Cannon Munitions			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EU1: <i>Enhanced Lethality Cannon Munitions</i>	-	0.000	9.866	10.000	-	10.000	0.000	0.000	0.000	0.000	0.000	19.866
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enhanced Lethality Cannon Munitions (ELCM) project will evaluate, develop, mature, and demonstrate new lethality technologies for 155mm cannon artillery munitions and evaluate their effectiveness in mitigating evolving and derived capability gaps, and support transition to Engineering Manufacturing Development (EMD). The ELCM project will prototype and accelerate the maturation of enhanced lethality technologies, such as Lithographic Fragmentation Technology (LFT), for 155mm cannon artillery munition. The ELCM project will accelerate the development and maturation of LFT for subsequent integration on the 155mm XM1128 high explosive projectile per HQDA G-8 Directed Requirement for a Rapid Bridging Solution for the 155mm Dual Purpose Improved Conventional Munition, 22 December 2016. ELCM addresses requirements for increased lethality above the current U.S. Army go-to-war 155mm high explosive unitary projectiles, the M795 Insensitive Munition.

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

	FY 2016	FY 2017	FY 2018
Title: Enhanced Lethality Cannon Munitions	-	9.866	10.000
Description: Evaluate, Develop, Prototype and Demonstrate Enhanced Lethality technologies.			
FY 2017 Plans: Accelerate development and maturation of enhanced lethality technologies, such as LFT, to transition from subsequent integration on the XM1128 to Engineering & Manufacturing Development (EMD) in FY 2018.			
FY 2018 Plans: Conduct prototyping of enhanced lethality technologies applicable to 155mm cannon artillery munitions.			
Accomplishments/Planned Programs Subtotals	-	9.866	10.000

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• BA5 PE 0604802A Project EU7: <i>Enhanced Lethality Cannon Munitions</i>	-	8.000	20.500	-	20.500	8.000	8.000	8.000	-	0.000	52.500

Remarks

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) EU1 / Enhanced Lethality Cannon Munitions

D. Acquisition Strategy

As a pre-Milestone B advanced component development and competitive prototyping project, this effort will identify, develop, prototype, evaluate, analyze, and demonstrate potential enhanced lethality alternative solutions for Government and/or Industry. This effort will quantify the respective maturity and effectiveness to mitigate capability gaps against representative enemy target sets and operational scenarios. Enhanced lethality technologies will be evaluated for merit and transition onto new cannon artillery munitions programs of record as appropriate. Following Milestone B, new cannon munitions programs will enter EMD.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
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 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
XM1128 Prototyping	MIPR	Various : Various	0.000	-		4.996		-		-		-	Continuing	Continuing	Continuing
ELCM Prototyping	MIPR	Various : Various	0.000	-		-		6.450		-		6.450	Continuing	Continuing	Continuing
Subtotal			0.000	-		4.996		6.450		-		6.450	-	-	-
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	Office of the Project Manager (PM) Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ	0.000	-		1.086		0.650		-		0.650	Continuing	Continuing	Continuing
Engineering Support	MIPR	Armament Research, Development and Engineering Center (ARDEC) : Picatinny Arsenal, NJ	0.000	-		2.040		1.000		-		1.000	Continuing	Continuing	Continuing
Subtotal			0.000	-		3.126		1.650		-		1.650	-	-	-
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Performance-related Lethality Developmental Testing	MIPR	Naval Surface Warfare Center (NSWC) - Dahlgren : Dahlgren, VA	0.000	-		1.086		1.400		-		1.400	Continuing	Continuing	Continuing
Lethality Simulations and Evaluation	MIPR	Army Materiel Systems Analysis Activity (AMSA) : Aberdeen, MD	0.000	-		0.658		0.500		-		0.500	Continuing	Continuing	Continuing

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) EU1 / Enhanced Lethality Cannon Munitions
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022							
	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				
XM1128 Prototyping																																
(1) XM1128 Preliminary Design Review (PDR)																													 ▲ XM1128 PDR			
XM1128 Lethality Testing																																
XM1128 Lethality Assessment																																
ELCM Prototyping																																
ELCM Lethality Testing																																
ELCM Lethality Assessment																																
XM1128 Baseline Prototyping; BA5 PE 0604802A EU7																																
(2) XM1128 Critical Design Review (CDR)																													 ▲ XM1128 CDR			
XM1128 Performance Qualification Testing (PQT); BA5 PE 0604802A EU7																																
(3) XM1128 Milestone C	 ▲ XM1128 MS-C																															

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) EU1 / <i>Enhanced Lethality Cannon Munitions</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
XM1128 Prototyping	3	2017	4	2017
XM1128 Preliminary Design Review (PDR)	4	2017	4	2017
XM1128 Lethality Testing	4	2017	4	2017
XM1128 Lethality Assessment	4	2017	1	2018
ELCM Prototyping	1	2018	2	2018
ELCM Lethality Testing	2	2018	3	2018
ELCM Lethality Assessment	4	2018	4	2018
XM1128 Baseline Prototyping; BA5 PE 0604802A EU7	1	2018	3	2018
XM1128 Critical Design Review (CDR)	3	2018	3	2018
XM1128 Performance Qualification Testing (PQT); BA5 PE 0604802A EU7	3	2018	4	2019
XM1128 Milestone C	2	2020	2	2020

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) EU2 / Improved Multi-Option Fuze (iMOFA/iMOFM)			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EU2: Improved Multi-Option Fuze (iMOFA/iMOFM)	-	0.000	7.892	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.892
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Improved Multi-Option Fuze (iMOFA/iMOFM) project will identify, develop, prototype, and demonstrate new improved multi-option fuze technologies, components, and subsystems based on Government-owned 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 project will support technology maturation and risk reduction, and will evaluate and analyze producibility, affordability, safety, and compatibility of these prototype potential materiel solutions in representative realistic performance-related developmental tests. Up to four potential NGPS with built-in DEF technology prototype solutions for improved multi-option fuzing systems from Government and/or Industry will be prototyped and evaluated. This project will enable fact-based analysis of new Government-owned 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)

	FY 2016	FY 2017	FY 2018
Title: Improved Multi-Option Fuze	-	7.892	-
Description: Identify, develop, prototype, and assess improved multi-option fuze technologies.			
FY 2017 Plans: 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.			
Accomplishments/Planned Programs Subtotals	-	7.892	-

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• BA5 PE 0604802A Project EU8: Improved Multi-Option Fuze	-	-	8.000	-	8.000	8.000	10.000	-	-	0.000	26.000

Remarks

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) EU2 / Improved Multi-Option Fuze (iMOFA/ iMOFM)

D. Acquisition Strategy

As an advanced component development and competitive prototyping project, this effort will identify, develop, prototype, evaluate, analyze, and demonstrate up to four potential improved Multi-Option Fuze solutions from Government and/or Industry. This effort will quantify their respective maturity and effectiveness in providing conventional Cannon Artillery 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 and technical implementation as an inherent part of improved Multi-Option Fuze programs of record via subsequent Engineering and Manufacturing Development program for Type Classification into existing multi-option fuzes for Cannon Artillery and Mortar Munitions 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-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition			Project (Number/Name) FA5 / Assured Precision Weapons and Munitions				
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
FA5: Assured Precision Weapons and Munitions	-	0.000	10.171	13.000	-	13.000	15.000	12.000	8.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Assured Precision Weapons and Munitions project is a continuation of FY14-16 efforts initiated under 644120A-ED5. 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 FY2018 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)

	FY 2016	FY 2017	FY 2018
Title: Assured Precision Weapons and Munitions Integrated Product Support	-	1.614	2.971
Description: Provide assured precision weapons and munitions technical subject matter expertise.			
FY 2017 Plans:			
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.			
FY 2018 Plans:			
The subject matter experts will continue coordinating with and supporting the development and technology delivery activities of the Air Force's 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			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FA5 / <i>Assured Precision Weapons and Munitions</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
evolving Joint Common GPS Specification and Interface Control Document for Precision Guided Munitions. Specific support focus includes requirements for MGUE Increment 2 and Pseudolite related technology maturity for Assured PNT Milestone decisions.				
<p>Title: PGM MGUE Anti-Spoof Risk Reduction Effort</p> <p>Description: Implementing Anti-Spoof (AS) capabilities on MGUE PGM receivers is a major risk to PGMs (including Precision Guidance Kit (PGK)). This effort will identify, evaluate, and quantify the predicted performance of AS capabilities against various MGUE PNT threat scenarios and their corresponding impacts on Time To Assured Navigation (TTAN) for PGMs and resulting operational performance impacts to reduce risk to multiple adopting PGM Programs of Record (PoRs).</p> <p>FY 2017 Plans: Identify corresponding risks and modify associated component/sub-system requirements that reflect demanding gun-hardened, hot-start, high-spin post-launch munition environments and assess potential AS capabilities to accelerate the subsequent adoption and integration of MGUE technology into PGK. Identify risks and develop prototypes that support subsequent development of a M-Code capable setter system that is backward compatible with legacy systems.</p>		-	8.557	-
<p>Title: Assured PNT related Integration Risk Mitigation</p> <p>Description: 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.</p> <p>FY 2018 Plans: Initiate analysis and evaluation of 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, including specific focus on Pseudolite related weapons and munitions integration risk mitigation and Emplaced Weapon Use-Case needed for Precision Fires.</p>		-	-	5.967
<p>Title: Assured PNT related Weapons and Munitions Prototyping</p> <p>Description: Develop, prototype, and evaluate new/emerging Assured PNT capabilities (including M-Code GPS and Pseudolites) into both Weapons and Munitions (including Cannon, Mortar, and Close Combat systems) operating in a complex heterogeneous system-of-systems environment.</p> <p>FY 2018 Plans:</p>		-	-	4.062

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FA5 / <i>Assured Precision Weapons and Munitions</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Initiate development, prototyping, and evaluation of new/emerging Assured PNT capabilities (including M-Code GPS and Pseudolites) for PGK, M777A2, and M119A3 when operating in a complex heterogeneous system-of-systems environment. Continue prototyping/evaluation in support of a subsequent M-Code/Pseudolite capable setter.			
Accomplishments/Planned Programs Subtotals	-	10.171	13.000

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

N/A

Remarks

D. Acquisition Strategy

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 as well as other Assured PNT related capabilities.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603639A / Tank and Medium Caliber Ammunition				FA5 / Assured Precision Weapons and Munitions							
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
PGM MGUE AS Risk Reduction	MIPR	DoD Ordnance Technology Consortium (DOTC) - TBD : Various	0.000	-		8.177	Dec 2016	-		-		-	0.000	8.177	4.000
Assured PNT related Integration Risk Mitigation and Prototyping	MIPR	DoD Ordnance Technology Consortium (DOTC) - TBD : Various	0.000	-		-		9.765	Dec 2017	-		9.765	25.127	34.892	34.701
Subtotal			0.000	-		8.177		9.765		-		9.765	25.127	43.069	38.701
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	Various	Office of the Project Manager (PM) Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ	0.000	-		0.508	Jan 2016	0.625	Jan 2018	-		0.625	1.725	2.858	2.858
Assured Precision Weapons and Munitions IPT Support	MIPR	Various : Various	0.000	-		1.106	Dec 2016	2.155	Jan 2017	-		2.155	6.465	9.726	9.726
Assured Technologies Engineering Support	MIPR	Armament Research, Development and Engineering Center (ARDEC) : Picatinny Arsenal, NJ	0.000	-		0.380	Dec 2016	0.455	Jan 2017	-		0.455	1.156	1.991	1.991
Subtotal			0.000	-		1.994		3.235		-		3.235	9.346	14.575	14.575
Project Cost Totals			0.000	-		10.171		13.000		-		13.000	34.473	57.644	53.276

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) FA5 / <i>Assured Precision Weapons and Munitions</i>
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	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
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<u>Remarks</u>	
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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) FA5 / Assured Precision Weapons and Munitions
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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																												
PGM MGUE Anti-Spoof Risk Reduction Effort																												
Assured PNT Requirements Development																												
Test and Software Development																												
Test report and results																												
Assured PNT related Integration Risk Mitigation																												
Assured PNT related Weapons and Munitions Prototyping																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) 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
PGM MGUE Anti-Spoof Risk Reduction Effort	1	2017	3	2018
Assured PNT Requirements Development	1	2017	2	2017
Test and Software Development	2	2017	1	2018
Test report and results	2	2018	3	2018
Assured PNT related Integration Risk Mitigation	1	2018	4	2021
Assured PNT related Weapons and Munitions Prototyping	1	2018	4	2021

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) FG1 / Cannon-Delivered Area Effects Munitions (C-DAEM)			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
FG1: Cannon-Delivered Area Effects Munitions (C-DAEM)	-	0.000	2.000	1.000	-	1.000	0.000	0.000	0.000	0.000	0.000	3.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Cannon-Delivered Area Effects Munitions (C-DAEM) project will analyze, identify, develop, prototype, and demonstrate 155mm Cannon Artillery munition area effects capability. C-DAEM are envisioned as a suite of 155mm artillery munitions, to provide U.S. ground forces with a capability to effectively engage area targets to destroy, neutralize, and/or suppress threat platforms and facilities, and deny threat forces full operational freedom within the targeted area. Initial objective values for C-DAEM would meet Dual Purpose Improved Conventional Munitions (DPICM) effects capabilities against personnel and light vehicles and exceed DPICM effects capabilities against armor. An Analysis of Alternatives (AoA) will be completed to best inform necessary area effect lethality requirements. The program addresses requirements from the U.S. Army adopted U.S. Marine Corps (USMC) C-DAEM Initial Capabilities Document (ICD) [AROC adopted 20 October 2016, JROC approved 11 May 2016]. The approved C-DAEM ICD as an Army requirement is located in the Capabilities and Army Requirements Documents number 0438. The Joint Staffing Designator is Joint Requirement Oversight Council (JROC) Interest.

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

	FY 2016	FY 2017	FY 2018
Title: C-DAEM AoA	-	2.000	1.000
Description: The C-DAEM AoA will assess a range of alternatives for replacing the DPICM for current 155mm cannon systems. The goal is to inform the Milestone Decision Authority (MDA) of cost-effective and affordable alternatives that provide performance similar to or better than DPICM.			
FY 2017 Plans: Initiate and conduct C-DAEM AoA.			
FY 2018 Plans: Complete C-DAEM AoA to inform C-DAEM required capabilities. Conduct Milestone A review with MDA.			
Accomplishments/Planned Programs Subtotals	-	2.000	1.000

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

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition	Project (Number/Name) FG1 / Cannon-Delivered Area Effects Munitions (C-DAEM)

D. Acquisition Strategy

As a Pre-Milestone A project in the Milestone Solution Analysis (MSA) phase, this effort will inform desired C-DAEM capabilities. Milestone A currently planned for 4Q FY 2018.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603639A / Tank and Medium Caliber Ammunition				Project (Number/Name) XT5 / 30mm Anti-Personnel and Counter UAS			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
XT5: 30mm Anti-Personnel and Counter UAS	-	0.000	0.000	2.475	-	2.475	3.500	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In FY 2018, PE 0603639A Project XT5 is a new start program.

Lightweight 30mm x 113mm (LW30) Airburst ammunition is a new capability identified as a Warfighter requirement. The LW30 airburst cartridge improves the warfighter's probability in defeating anti-personnel and anti-materiel targets due to increased lethality. Airburst capability allows a much higher probability of achieving a first burst kill against enemy personnel targets in the open. The LW30 will retain its dual purpose warhead, allowing it to continue to defeat light armored threats through point detonation. The cartridge provides increased lethal effects against personnel & soft-skin vehicular targets increasing Soldier Survivability while troops are in contact engagements and decreases the required number of rounds to reach the desired lethal effects. FY 2018 supports Technology Maturation and Risk Reduction effort.

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

	FY 2016	FY 2017	FY 2018
Title: Pre Engineering Manufacturing Development Activities	-	-	2.475
Description: Pre-Milestone B approval. Technology Readiness Level 6 must be demonstrated.			
FY 2018 Plans: FY 2018 Technology Maturation and Risk Reduction will be performed by the Government. Initial ammunition design concepts will be developed along with integration studies into the weapons systems.			
Accomplishments/Planned Programs Subtotals	-	-	2.475

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

N/A

Remarks

D. Acquisition Strategy

The LW30 Airburst cartridge will be developed through a competitive Engineering and Manufacturing Development (EMD) program. As part of the pre-EMD activities, an Other Technology Agreement (OTA) contract will be award to develop competitive prototypes to demonstrate technology maturation level 6. For the first phase of EMD, two Full and Open competitive contracts will be awarded. Prior to Development Test & Evaluation (DT&E), the Government will down-select to a single contractor for EMD completion followed by a contract for Low Rate Initial Production (LRIP) and two production options.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603639A / <i>Tank and Medium Caliber Ammunition</i>	Project (Number/Name) XT5 / <i>30mm Anti-Personnel and Counter UAS</i>

E. Performance Metrics

N/A

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603645A / Armored Systems Modernization Adv Dev
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	32.739	-	32.739	32.743	52.741	52.733	38.000	Continuing	Continuing
<i>EV7: Combat Vehicle Prototyping</i>	-	0.000	0.000	32.739	-	32.739	32.743	52.741	52.733	38.000	Continuing	Continuing

Note

Project EV7 (Combat Vehicle Prototyping) is a continuation of efforts previously executed under 0604115A, Technology Maturation Initiatives.

A. Mission Description and Budget Item Justification

Next generation combat vehicle / FFV prototyping provides focused investment for development of the next generation combat vehicles. The purpose of this funding is to integrate the next generation of technology enabled capabilities developed in the S&T portfolio to demonstrate new capabilities to meet emerging military needs, provide hardware for Soldier operational evaluation/feedback, to determine integration potential across the current Army portfolio of ground vehicles and to develop platform level prototypes

Prototyping allows for aggressive innovation (provides a bridge from Science and Technology (S&T) investment to vehicle integration and operational use), ensures Warfighter requirements are met, mitigates capability gaps, reduces risks (reduces acquisition programmatic technical risks, stabilizes requirements through user evaluation and helps Army senior leaders make informed decisions), enables affordability (minimizes changes during the Technology Maturation and Risk Reduction (TMRR) and Engineering & Manufacturing Development (EMD) acquisition phases), and has the potential to accelerates acquisition.

This Investment enables technology development and offers the potential to accelerate acquisition by reducing risk and possible time during the acquisition cycle. It will inform Army combat vehicle modernization decisions by informing Army leadership on cost, schedule, technical feasibility, and performance trade-offs. This will impact decisions on modification and modernization of existing platforms as well as decisions to develop new vehicles or critical subsystems. It will provide feedback and technological options for the requirements development to streamline the requirements and acquisition process. This funding will mitigate the risk of technology over reach, and enable the transition of technology from Government S&T investments and other potential technology development sources.

The funding in FY 2018 will support continued advanced concept development, trade studies, technology maturation/testing, technical/operational/affordability analyses, and prototyping and demonstration of combat vehicles to assess future concepts and designs that integrate emerging Science and Technology advancements.

This work is fully coordinated with and complementary to PE 0603005A (Combat Vehicle and Automotive Advanced Technology) and PE 0604115 (Technology Maturation Initiatives).

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603645A / <i>Armored Systems Modernization Adv Dev</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	5.500	5.000	-	5.000
Current President's Budget	0.000	0.000	32.739	-	32.739
Total Adjustments	0.000	-5.500	27.739	-	27.739
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	-5.500	27.739	-	27.739

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603645A / <i>Armored Systems Modernization Adv Dev</i>				Project (Number/Name) EV7 / <i>Combat Vehicle Prototyping</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
<i>EV7: Combat Vehicle Prototyping</i>	-	0.000	0.000	32.739	-	32.739	32.743	52.741	52.733	38.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project EV7 (Combat Vehicle Prototyping) is a continuation of efforts previously executed under 0604115A, Technology Maturation Initiatives.

A. Mission Description and Budget Item Justification

Next generation combat vehicle / FFV prototyping provides focused investment for development of the next generation combat vehicles. The purpose of this funding is to integrate the next generation of technology enabled capabilities developed in the S&T portfolio to demonstrate new capabilities to meet emerging military needs, provide hardware for Soldier operational evaluation / feedback, to determine integration potential across the current Army portfolio of ground vehicles and to develop platform level prototypes

Prototyping allows for aggressive innovation (provides a bridge from Science and Technology (S&T) investment to vehicle integration and operational use), ensures Warfighter requirements are met, mitigates capability gaps, reduces risks (reduces acquisition programmatic technical risks, stabilizes requirements through user evaluation and helps Army senior leaders make informed decisions), enables affordability (minimizes changes during the Technology Maturation and Risk Reduction (TMRR) and Engineering & Manufacturing Development (EMD) acquisition phases), and has the potential to accelerates acquisition.

This Investment enables technology development and offers the potential to accelerate acquisition by reducing risk and possible time during the acquisition cycle. It will inform Army combat vehicle modernization decisions by informing Army leadership on cost, schedule, technical feasibility, and performance trade-offs. This will impact decisions on modification and modernization of existing platforms as well as decisions to develop new vehicles or critical subsystems. It will provide feedback and technological options for the requirements development to streamline the requirements and acquisition process. This funding will mitigate the risk of technology over reach, and enable the transition of technology from Government S&T investments and other potential technology development sources.

The funding in FY 2018 will support continued advanced concept development, trade studies, technology maturation / testing, technical / operational / affordability analyses, and prototyping and demonstration of combat vehicles to assess future concepts and designs that integrate emerging Science and Technology advancements.

This work is fully coordinated with and complementary to PE 0603005A (Combat Vehicle and Automotive Advanced Technology) and PE 0604115 (Technology Maturation Initiatives).

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

	FY 2016	FY 2017	FY 2018
Title: Project Management	-	-	14.854

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / <i>Armored Systems Modernization Adv Dev</i>	Project (Number/Name) EV7 / <i>Combat Vehicle Prototyping</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Description: This effort conducts system level ground vehicle advanced concepting, prototyping and demonstration. This effort will partner Government organic capabilities and Industry for an iterative and integrated combat vehicle concepting and prototyping process to inform and stabilize future vehicle capability Requirements, inform current and future vehicle performance characteristics, inform affordability, reduce future acquisition risk, and evaluate and update Operational Concepts. Activity will include the integration and demonstration of a series of subsystem demonstrators building off of previous investment in ground combat acquisition and science and technology programs.</p> <p>FY 2018 Plans: Will build off of previous and current investments in Science and Technology and Acquisition efforts (PE's 0605625, 0604115, 0603005) to further concept development and system level risk reduction for the next generation of combat vehicles. The next generation combat vehicle team (PEO GCS in coordination with RDECOM) will oversee a continued public private partnership between organic Government and private Industry, monitoring and tracking technical progress related to the development concepts and designs for the next generation of combat vehicles. It will mature system level concepts and designs to integrate S&T developed advanced ground vehicle subsystem technologies such as active protection, powertrains, armors, and situational awareness suites into a system level experimental prototype. It will conduct experimental demonstration of closed hatch Infantry Fighting Vehicle and split-squad operations. It will leverage organic early synthetic prototyping capability to conduct soldier-in-the-loop virtual simulations of future combat vehicle concepts to assess next generation capabilities and conduct system level performance trades. The team will conduct analysis based on all the data currently available from the FFV and Squad Centric Mounted Maneuver (SCMM) efforts to inform investments in FY19 and beyond.</p>			
<p>Title: Test & Evaluation</p> <p>FY 2018 Plans: Test & Evaluation includes but not limited to safety, integration, and demonstration.</p>	-	-	7.981
<p>Title: Other</p> <p>FY 2018 Plans: Other efforts include software integration library (SIL), crew station SIL, power and data architecture, powerpack components, software support and development. The efforts also include integration and support services for the Squad Centric Mounted Maneuver (SCMM) project; ground movement target indicator radar, unmanned aerial system sensor, hardware for the head mount display subsystem, fabricates remaining hardware in support of SCMM vehicle integration, and hardware and support for the SCMM autonomy subsystem and vehicle electronics architecture subsystem.</p>	-	-	6.904
<p>Title: Modeling & Simulation</p> <p>FY 2018 Plans:</p>	-	-	3.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / <i>Armored Systems Modernization Adv Dev</i>	Project (Number/Name) EV7 / <i>Combat Vehicle Prototyping</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
The modeling and simulation effort is to assess operational needs and operational employment by using the Maneuver Battle lab at Fort Benning and One Semi-Automated Forces (OneSAF) modeling. Results provide the analytical underpinnings to support development of requirements.			
Accomplishments/Planned Programs Subtotals	-	-	32.739

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• RDT&E,A: PE 0604115A	-	25.000	-	-	-	-	-	-	-	0	25.000

Remarks

D. Acquisition Strategy

Competitive contracts will be awarded. This project will continue to exercise competitively awarded contracts using best value source selection procedures.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored Systems Modernization Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping
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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
NGCV Contract(s)	C/TBD	TBD : TBD	0.000	-		-		5.671	Oct 2017	-		5.671	Continuing	Continuing	Continuing
SCMM Phase 1 Contracts	C/TBD	TBD : TBD	0.000	-		-		1.233	Oct 2017	-		1.233	Continuing	Continuing	Continuing
Subtotal			0.000	-		-		6.904		-		6.904	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
PMO/PEO Support	MIPR	PM/PEO : Warren, MI	0.000	-		-		14.854	Dec 2017	-		14.854	0.000	14.854	0.000
Subtotal			0.000	-		-		14.854		-		14.854	0.000	14.854	0.000

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
SCMM User Evaluation	C/TBD	TBD : TBD	0.000	-		-		7.981	Oct 2017	-		7.981	Continuing	Continuing	Continuing
Modeling & Simulation	C/TBD	TBD : TBD	0.000	-		-		3.000	Jan 2018	-		3.000	Continuing	Continuing	Continuing
Subtotal			0.000	-		-		10.981		-		10.981	-	-	-

			Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	-		0.000		32.739		-		32.739	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / Armored Systems Modernization Adv Dev	Project (Number/Name) EV7 / Combat Vehicle Prototyping
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022															
	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	2	3	4								
SCMM Phase 1: Modified Bradley Fire Team IFV																																								
(1) Live Experiment																					SCMM Phase 1: Modified Bradley Fire Team IFV								▲ Live Experiment											
Operational Modeling																									Operational Modeling															
Requirements Development																																	Requirements Development							
Operational Modeling/O&O																																					Operational Modeling/O&O			
Technologies Assessments and prioritization																									Technologies Assessments and prioritization															
Prototyping Phase																	NGCV Prototyping Phase (Design/Build/Test)																							

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603645A / <i>Armored Systems Modernization Adv Dev</i>	Project (Number/Name) EV7 / <i>Combat Vehicle Prototyping</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SCMM Phase 1: Modified Bradley Fire Team IFV	1	2018	4	2018
Live Experiment	1	2019	1	2019
Operational Modeling	1	2018	4	2018
Requirements Development	1	2020	4	2022
Operational Modeling/O&O	3	2020	4	2022
Technologies Assessments and prioritization	1	2018	4	2018
Prototyping Phase	3	2018	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603747A / Soldier Support and Survivability
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	5.035	10.506	10.157	3.000	13.157	8.640	7.662	8.519	8.646	Continuing	Continuing
610: Food Adv Development	-	0.020	5.299	6.548	-	6.548	4.648	4.158	4.273	4.225	Continuing	Continuing
C08: Rapid Equipping Force	-	3.907	3.259	3.162	3.000	6.162	3.000	3.000	3.000	3.000	Continuing	Continuing
EL1: Army Field Feeding Programs	-	1.108	1.948	0.447	-	0.447	0.992	0.504	1.246	1.421	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element supports component development and prototyping for organizational equipment, improved individual clothing and equipment that enhance Soldier battlefield effectiveness, survivability, and sustainment. This program element also supports the component development and prototyping of joint service food and combat feeding equipment designed to reduce logistics burden.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	4.301	10.506	12.840	-	12.840
Current President's Budget	5.035	10.506	10.157	3.000	13.157
Total Adjustments	0.734	0.000	-2.683	3.000	0.317
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.734	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	-2.683	3.000	0.317

Change Summary Explanation

FY2016 increase of \$0.734M reflects adjustment to actuals
 FY2018 Base decrease of \$2.683M - Rapid Equipping Force decrease of \$2.683M (Program Evaluation Group Decision).
 FY2018 OCO Increase of \$3.000M - Army Rapid Equipping Force OCO requirement

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) 610 / <i>Food Adv Development</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
610: <i>Food Adv Development</i>	-	0.020	5.299	6.548	-	6.548	4.648	4.158	4.273	4.225	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides for the advanced component development and prototyping of joint service food and combat feeding equipment designed to reduce the logistics burden and Operation and Support (O&S) costs of subsistence support to service personnel. Project supports development of rations and rapidly deployable field food service equipment. Project conducts demonstration and validation of improved subsistence and subsistence support items used to enhance soldier effectiveness and quality of life in all four Services, as part of an integrated Department of Defense (DoD) Food Research, Development, Test, Evaluation and Engineering Program. The Program is reviewed and validated twice annually by the DoD Combat Feeding Research and Engineering Board (CFREB) as part of the Joint Service Food Program. This project develops critical enablers that support the Joint Future Force Capabilities and the Joint expeditionary mindset by maintaining readiness through fielding and integrating new equipment. This equipment enhances the field soldier's well-being and provides the soldier with usable equipment, in addition to reducing sustainment requirements, related Combat Support/Combat Service Support (CS/CSS) demands on lift, combat zone footprint, and costs for logistical support.

This PE/Project supports Field Feeding Programs for all the services.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Fielded Individual Ration Improvement Project (FIRIP)	-	0.895	0.663	-	0.663
Description: Continuous product improvement of project for the Meal, Ready to Eat (MRE) through the advanced development of novel nutrition, processing and packaging technologies to improve operational effectiveness and improve logistics.					
FY 2017 Plans: Continue to conduct in-house product development of food components and identify suitable COTS/NDI candidate items for fielded individual operational rations (e.g. MRE 2020 date of pack) to enhance Warfighter acceptability, increase consumption and improve nutritional intake. Conduct pilot scale in-house production to support engineering design, technology insertion, and commercial producibility. Will develop, integrate and validate state-of-the art science and technology, food processing and primary/secondary packaging innovations into individual ration platforms to increase operational effectiveness. Optimize food component processing and packaging to introduce targeted items/capabilities into individual ration platforms for enhanced acceptability, nutrition and performance. Will transition to 6.5 for operational testing.					
FY 2018 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) 610 / <i>Food Adv Development</i>
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Will continue to conduct in-house product development of food components and identify suitable COTS/NDI candidate items for fielded individual operational rations (MRE 2021 date of pack) to enhance Warfighter acceptability, increase consumption and improve nutritional intake. Will conduct pilot scale in-house production to support engineering design, technology insertion, and commercial producibility. Will develop, integrate and validate state-of-the art science and technology, food processing and primary/secondary packaging innovations into individual ration platforms to increase operational effectiveness. Will optimize food component processing and packaging to introduce targeted items/capabilities into individual ration platforms for enhanced acceptability, nutrition and performance. Will transition to 6.5 for operational testing.					
<p>Title: Assault/Special Purpose Ration Improvement Project (ASPIP)</p> <p>Description: Continuous product improvement of special purpose rations through the advanced development of novel nutrition, processing and packaging technologies to improve operational effectiveness and improve logistics. Special purpose rations include the Meal, Cold Weather/Long Range Patrol (MCW/LRP), First Strike Ration (FSR), and Modular Operational Ration Enhancement (MORE).</p> <p>FY 2017 Plans: Continue to identify COTS/NDI components for the MCW/LRP, FSR and/or MORE to enhance acceptability, variety, consumption and nutritional value of scenario-specific combat rations based on user feedback, focus groups, emerging products and technologies and user requirements. Conduct accelerated and long term storage studies on candidate components. Transition to 6.5 for operational testing.</p> <p>FY 2018 Base Plans: Will continue to identify COTS/NDI components for the MCW/LRP, FSR and/or MORE to enhance acceptability, variety, consumption and nutritional value of scenario-specific combat rations based on user feedback, focus groups, emerging products and technologies and user requirements. Will conduct accelerated and long term storage studies on candidate components. Will transition to 6.5 for operational testing.</p>	-	0.519	0.463	-	0.463
<p>Title: Fielded Group Ration Improvement Project (FGRIP)</p> <p>Description: Continuous product improvement project to update/improve group ration components, menus, and packaging by integrating state-of-the-art military/commercial packaging and technology base transitions. The family of Unitized Group Rations (UGRs) includes the Unitized Group Ration - Heat & Serve (UGR-H&S), Unitized Group Ration - Express (UGR-E), Unitized Group Ration - A (UGR-A), and Unitized Group Ration - M (UGR-M).</p>	-	0.831	1.062	-	1.062

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) 610 / <i>Food Adv Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p><i>FY 2017 Plans:</i> Continue efforts to update/improve components, menus and packaging to increase consumption and overall nutritional intake of the family of Unitized Group Rations for UGR-A (FY19 menus), M, E and H&S (2018 date of pack). Identify COTS/NDIs and/or develop new food components in-house, conduct in-house testing, down-select items and develop test menus for Warfighter evaluation. Develop, integrate and validate state-of-the-art science and technology, food processing and primary/secondary packaging innovations into group ration platforms to increase operational effectiveness, functionality and improve logistics. Transition to 6.5 for operational testing.</p> <p><i>FY 2018 Base Plans:</i> Will continue efforts to update/improve components, menus and packaging to increase consumption and overall nutritional intake of the family of Unitized Group Rations for UGR-A, M, E and H&S future year menus. Identify COTS/NDIs and/or develop new food components in-house, conduct in-house testing, down-select items and develop test menus for Warfighter evaluation. Will develop, integrate and validate state-of-the-art science and technology, food processing and primary/secondary packaging innovations into group ration platforms to increase operational effectiveness, functionality and improve logistics. Will continue to transition to 6.5 for operational testing.</p>					
<p><i>Title:</i> US Navy Standard Core Menu (NSCM) Continuous Product Improvement Project</p> <p><i>Description:</i> Provide recommendations to the Naval Supply Systems Command (NAVSUP) for upgrading/improving Navy Standard Core Menu components by introducing new preparation techniques to enhance menu acceptance and effectiveness while reducing labor requirements.</p> <p><i>FY 2017 Plans:</i> Continue to identify and validate COTS/NDI candidate enhancements to the NSCM. Will test and evaluate new products and techniques using Navy Galley equipment. Provide recommendations for improving menu components by introducing new commercial items and state-of-the-art food preparation and feeding techniques to enhance menu acceptance and reduce labor requirements. Transition product summaries and results/recommendation to NAVSUP for adoption and procurement.</p> <p><i>FY 2018 Base Plans:</i> Will continue to identify and validate COTS/NDI candidate enhancements to the NSCM. Will test and evaluate new products and techniques using Navy Galley equipment. Will provide recommendations for improving menu components by introducing new commercial items and state-of-the-art food preparation and feeding techniques</p>	-	0.344	0.463	-	0.463

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) 610 / <i>Food Adv Development</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
to enhance menu acceptance and reduce labor requirements. Will transition product summaries and results/recommendation to NAVSUP for adoption and procurement.					
<p>Title: Block Upgrades and Operational Improvements for Expeditionary Field Feeding Equipment.</p> <p>Description: Eliminate the sole sourcing of tray ration heater component parts. Reduce overall water consumption through the use of non-immersive cooking technologies and more efficient ware-washing equipment. Increase Kitchen flexibility through appliance upgrades. To reduce the overall fuel consumption of Expeditionary Field Feeding Equipment through enhanced combustion technologies.</p> <p>FY 2017 Plans: Coordinate and conduct demonstration & validation (DV) of prototypes to support modification/replacement of USMC field feeding equipment. Transition to 6.5.</p>	-	0.351	-	-	-
<p>Title: Multi-Purpose Individual Heating Technology (MIT)</p> <p>Description: Develop a disposable, lightweight heating mechanism as a low-cost component of the Meal, Cold Weather/Long Range Patrol (MCW/LRP) to facilitate preparation of operational rations in extreme environments with reduced resource requirements and increased ease of use.</p> <p>FY 2017 Plans: Evaluate MIT prototypes transitioned to 6.4. Will conduct in-house test and evaluation (T&E), and transition results to 6.5.</p> <p>FY 2018 Base Plans: Will evaluate MIT prototypes transitioned to 6.4. Will conduct in-house test and evaluation (T&E), and transition results to 6.5 for Engineering and Manufacturing Development.</p>	-	0.315	0.496	-	0.496
<p>Title: Joint Intuitive Multi-function Kitchen Equipment (JIMKE)</p> <p>Description: Reduce logistics burden associated with life cycle management of Navy (USN), Air Force (USAF) and Marine Corps (USMC) foodservice equipment. Integrate diagnostic technologies to predict maintenance, reduce labor associated with troubleshooting equipment in the field, and increase mean time between failures (MTBF).</p> <p>FY 2017 Plans:</p>	-	0.533	0.730	-	0.730

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) 610 / <i>Food Adv Development</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Develop required contract documentation to procure equipment prototypes with multi-functional capabilities for USN, USAF, and USMC. Award contracts based on specifications for each Service and begin in-house prototype test and evaluation. FY 2018 Base Plans: Will complete in-house prototype test and evaluation, and transition to 6.5 for operational testing.					
Title: Navy Galley and Scullery Upgrades Description: Continuously modernize foodservice operations by adding capabilities to provide optimized feeding, standardizing foodservice equipment assets fleet-wide, improving space utilization, and facilitating the continued use of the NSCM. Design, processes and equipment insertions will be implemented on legacy platforms during overhaul periods and during the new construction process on future vessels. FY 2017 Plans: Identify advanced equipment technologies to support existing and new ship class designs to support the Galley and Scullery operations. Conduct in-house testing of equipment recommended by Navy subject matter experts. Transition T&E reports to USN. FY 2018 Base Plans: Will identify advanced equipment technologies to support existing and new ship class designs to support the Galley and Scullery operations. Conduct in-house testing of equipment recommended by Navy subject matter experts. Will transition T&E reports to USN.	-	0.445	0.680	-	0.680
Title: Greywater Recycling for the Basic Expeditionary Airfield Resources (BEAR) Kitchen Systems Description: Leverage NDI and COTS greywater filtration technologies to reduce operating and support (O&S) costs for the BEAR kitchen system. FY 2017 Plans: Review current Army science & technology efforts related to greywater recycling systems and conduct market research of existing commercial systems. Prepare Statements of Work (SOWs) and other required contract documents. Award contract to procure a greywater system to support Air Force BEAR kitchen and sanitation operations.	-	0.337	-	-	-
Title: Modular Integrated Kitchen System (MIKS)	-	0.319	-	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) 610 / <i>Food Adv Development</i>			
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Description: Design a standardized mounting system for all Galley equipment to significantly reduce technical labor skills required to complete deck modifications. MIKS will standardize electrical and water requirements, enhance procurement options, decrease operating and support (O&S) costs, and increase the speed of installing new technologies into the Galley/Scullery areas.</p> <p>FY 2017 Plans: Identify and evaluate potential NDI/COTS solutions. Prepare SOWs and other required contract documents. Award contract to build integrated modular rail system to support integration of equipment into galley operations.</p>					
<p>Title: Defense Logistics Agency (DLA)</p> <p>Description: Support management of the Department of Defense (DoD) Electronic Document Access (EDA) and Wide Area Workflow (WAWF) programs.</p> <p>FY 2016 Accomplishments: Funded DLA Document Services to support management of the DoD EDA and WAWF programs.</p> <p>FY 2017 Plans: Fund DLA Document Services to support management of the DoD EDA and WAWF programs.</p> <p>FY 2018 Base Plans: Will fund DLA Document Services to support management of the DoD EDA and WAWF programs.</p>					
	0.020	0.410	0.586	-	0.586
<p>Title: Tray Ration Heater – Improved (TRH-I)</p> <p>Description: Develop an updated and compact Tray Ration Heater to meet the requirements of the smaller, up-armored HMMWV cargo beds. Reduce the overall weight, improve man-portability, heat transfer efficiency, thermal storage efficiency, and reduce water consumption. Meet USMC approved Statement of Need requirement for a Modernized Tray Ration Heat System.</p> <p>FY 2018 Base Plans: Will develop TRH-I SOW and technical objectives. Will prepare contract documentation and award TRH-I development contract.</p>					
	-	-	0.495	-	0.495
<p>Title: Inflatable Refrigerated Space (IRefS)</p>					
	-	-	0.610	-	0.610

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) 610 / <i>Food Adv Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Description: Develop a pallet sized, rapidly deployable, air deliverable field refrigeration system for safe storage of UGR-A rations to units located in austere environments with little to no ability to obtain rigid refrigerated containers.</p> <p>FY 2018 Base Plans: Will develop SOW with objective and threshold performance criteria and award contract to design and fabricate a high fidelity IRefS prototype.</p>					
<p>Title: Navy Mobile Feeding Galley</p> <p>Description: Develop a mobile feeding system that is equipped with innovative cooking technology. The platform will have the capability to produce a rotating menu of fresh and healthy cuisine that will appeal to the millennial generation of sailors.</p> <p>FY 2018 Base Plans: Will conduct market research to define equipment needs. Will prepare SOW and contract documents for modified or prototype mobile system and award contract.</p>	-	-	0.300	-	0.300
Accomplishments/Planned Programs Subtotals	0.020	5.299	6.548	-	6.548

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• 06054713A .548: <i>RDTE Combat Feeding, Clothing & Equip, Military Subsistence System</i>	1.374	0.759	0.700	-	0.700	0.962	1.786	1.828	1.705	Continuing	Continuing
• 06054713A EL2: <i>RDTE Combat Feeding, Clothing & Equip, Army Field Feeding Equip</i>	0.320	1.295	3.002	-	3.002	3.179	4.207	2.865	2.032	Continuing	Continuing
• 06043747A .EL1: <i>RDTE Soldier Support & Survivability - Army Field Feeding Programs</i>	1.108	1.948	0.447	-	0.447	0.992	0.504	1.246	1.421	Continuing	Continuing
• M65801: <i>OPA Refrigerated Container Systems</i>	10.354	7.459	10.877	-	10.877	13.660	11.165	15.253	14.137	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017		
Appropriation/Budget Activity 2040 / 4		R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>		Project (Number/Name) 610 / <i>Food Adv Development</i>	

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

D. Acquisition Strategy

Project development will transition to Engineering & Manufacturing Development and production.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>				Project (Number/Name) C08 / <i>Rapid Equipping Force</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
C08: <i>Rapid Equipping Force</i>	-	3.907	3.259	3.162	3.000	6.162	3.000	3.000	3.000	3.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Equipment mix and configuration may change based on changes in operational environment and circumstances.

A. Mission Description and Budget Item Justification

The Rapid Equipping Force (REF) supports Combatant Command (COCOM)/Army Service Component Command (ASCC) based on emerging rapid equipment requirements. The REF is an enduring organization (Base funded) per Memorandum, Under Secretary of the Army, 30 Jan 2014, subject: Implementation Plan for Stabilization of the Rapid Equipping Force (REF).

The REF is the Army's Quick Reaction Capability (QRC) with the ability to acquire, integrate and sustain Commercial-Off-The Shelf (COTS), Government Off-The-Shelf (GOTS), Non-Developmental Item (NDI), and non-standard equipment solutions to meet urgent combat requirements for globally employed forces. It inserts selected future force technologies, capabilities, and surrogate materiel solutions into deployed, deploying, select-prepared to deploy, and transformational forces for operational evaluation, assessment, and evolutionary development. The REF assesses the provided capabilities to improve future solutions to inform materiel development for the future Army capability requirements and to potentially transition the capability to an Army acquisition program.

The REF bridges the gap between the Army's traditional acquisition process and immediate equipping needs. The REF pursues tangible solutions that can be equipped rapidly with a goal of 180 days. The REF focuses on finding immediate and effective game-changing capabilities to increase Soldier Readiness, effectiveness, protection, and lethality in any operational environment. The REF 10-Liner process provides the ability to react quickly to an ever-changing enemy who changes in days and months, not years in a complex world. The REF coordinates with the COCOMs/ASCCs in theater to fully understand their urgent needs, for which the REF acquisition capability may identify, procure, deliver, and sustain solutions to the deployed units. Although the REF works directly with Operational Commanders at all levels, it focuses on Brigade level and below to equip solutions to identified capability gaps.

The Army Acquisition Executive designated Program Executive Office (PEO) Soldier as the Milestone Decision Authority (MDA) to institutionalize the acquisition authorities in support of the REF and to provide proper acquisition oversight while enhancing visibility of these efforts. The MDA will ensure flexibility and speed focused on the Soldier's needs serviced by the dedicated REF Program Management Office (PMO). This establishes a formal acquisition reporting chain that leverages existing reporting venues to ensure appropriate ASA (ALT) visibility, oversight, and direction.

The REF capabilities cross all Warfighter Functions:

1. Mission Command
2. Movement and Maneuver
3. Intelligence

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) C08 / <i>Rapid Equipping Force</i>
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- 4. Fires
- 5. Sustainment
- 6. Protection

The REF FY18 RDT&E request is \$3.162 million (Base) and \$3.000 million (OCO) and is for system integration, testing, and evaluation to support project requirements.

The RDT&E funding also provides the REF the flexibility to invest in near-term, and innovative solutions. RDT&E funds are necessary in the majority of all REF projects. Most importantly, REF requires RDT&E funds to conduct safety certification (testing) for non-standard equipment before it is equipped to the Soldier. This critical requirement exists to ensure that REF-provided equipment is safe for Soldiers to use and that any risks are identified and documented. The REF also requires RDT&E funds to integrate several different COTS/GOTS and NDI technologies into one capability that solves the tougher and more complex problems. RDT&E funds maybe used to further develop high (>6) Technology Readiness Level (TRL) systems or advanced technologies in conjunction with industry and Other Governmental Agencies (OGAs). Frequently, these technologies only need small amounts of funding to help them achieve a maturity level that is suitable to solve deployed U.S. Army Forces problems.

The REF requires RDT&E funds to modify, test, and evaluate existing technologies that were developed for one purpose, however may be suitable to solve another problem. REF will also fund deliberate projects in support of technology-solution-scouting to meet anticipated Army needs and to mitigate operational gaps. These efforts measure and identify current technologies, and provide information to better inform Army Training and Doctrine Command (TRADOC) and other communities of interest, with the intent of enlightening future Army requirements. Example efforts that may require RDTE include the following projects: Tactical Satellite Communications (SATCOM) and communications systems; tactical and small Combat Out Post/Forward Operating Base (COP/FOB) Intelligence, Surveillance, and Reconnaissance (ISR) and Force Protection systems; Counter Unmanned Aerial Systems (CUAS); Electronic Warfare (EW); Non-Tactical Vehicles (NTV); Persistent Duration UAS, and Subterranean (SubT) Operations.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Rapid Equipping Force	3.907	3.259	3.162	3.000	6.162
Description: Funding is provided for the following effort.					
FY 2016 Accomplishments: The demand for REF 10-liner requirements is based on the increased tempo of transitioning brigades in Operation Freedom Sentinel (OFS) with nine (9) month deployments; the expansion of brigades' operational environments (OEs) that require units to operate in larger more isolated areas, and a new force structure and role in OFS. Additionally, increased Army OPTEMPO requirements in other areas of responsibility, such as USAREUR, USARPAC, and USARAF, and support for the Global Response Force (GRF) have continued to					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) C08 / <i>Rapid Equipping Force</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>generate increased demands for REF support. At the end of FY16, the REF had 551 total requirements - 419 OCO requirement.</p> <p>FY 2017 Plans: The REF partners with ASCCs forces and Army SOF community to perform DS to globally deployed Soldiers and regionally aligned BCTs. The REF anticipates increased uncertainty regarding the future of OIR and other operations in the CENTCOM AOR requiring additional flexibility to develop technological solutions supporting the reduced numbers of Soldiers operating globally in order to fill force protection gaps in the face of a smaller and more lethal terrorism threat. The REF expects to increase our engagement with the ASCCs in order to address capability gaps generated by geographical and environmental constraints and improve our understanding of evolving threats and operating conditions within the respective ASCC areas of operations. The REF also expects to play a much more deliberate role in providing support to the Global Response Force as they prepare for a wider range of response missions. In accordance with REF’s participation in the Office of Secretary of Defense (OSD) led quick reaction capability effort, the Army determined the REF would provide the Army’s warm base capability with ~590 (Base/OCO) requirements in FY17 and beyond.</p> <p>For FY17 the REF projects ~590 (Base/OCO) requirements in the following REF Warfighter Functions:.</p> <ul style="list-style-type: none"> 1 – Mission Command (49K) 2 – Movement and Maneuver (97K) 3 – Intelligence (39K) 4 – Fires (4K) 5 – Sustainment (46K) 6 – Protection (91K) <p>The REF anticipates ATEC testing and evaluation cost of \$2.933 million. The REF requires RDT&E funds to test technologies in order to ensure suitability and safety before equipping the Soldier – any modified COTS/GOTS/ NDI items has to be tested.</p> <p>FY 2018 Base Plans: The REF partners with ASCC forces and Army SOF community to support globally deployed Soldiers and regionally aligned BCTs in all areas of responsibility. The REF anticipates increased uncertainty regarding the future of OIR and other operations in the CENTCOM AOR requiring additional flexibility to develop technological solutions supporting the reduced numbers of Soldiers operating globally in order to fill force protection gaps in</p>					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) C08 / <i>Rapid Equipping Force</i>

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>the face of a lethal terrorism threat. The REF expects to increase its engagement with the ASCCs to address capability gaps generated by geographical and environmental constraints. Conversely, the REF will increase its understanding of evolving threats and operating conditions within the respective ASCC areas of operations. The REF also expects to play a much more deliberate role in providing support to the GRF as they prepare for a wider range of response missions. In accordance with REF’s participation in the Office of Secretary of Defense (OSD) led quick reaction capability effort, the Army determined the REF would provide the Army’s warm base capability at ~600 (Base/OCO) requirements in FY18 and beyond.</p> <p>For FY18 the REF projects ~600 (Base/OCO) requirements in the following REF Warfighter Functions:</p> <ol style="list-style-type: none"> 1. Mission Command (\$48K) 2. Movement and Maneuver (\$96K) 3. Intelligence (\$38K) 4. Fires (\$3K) 5. Sustainment (\$44K) 6. Protection (\$88K) <p>The REF anticipates ATEC testing and evaluation cost of \$2.845million. The REF requires RDT&E funds to test technologies in order to ensure suitability and safety before equipping the Soldier – any modified COTS/GOTS/ NDI item has to be tested.</p> <p>FY 2018 OCO Plans: The FY18 OCO funding is required to support emerging requirements to meet capability gaps in Operation Freedom Sentinel (OFS), Operation Inherent Resolve (OIR), Operation Atlantic Resolve (OAR), Horn of Africa (HOA), and all OCO funded operations/regions.</p> <p>For FY18 the REF projects ~600 (Base/OCO) requirements in the following REF Warfighter Functions:</p> <ol style="list-style-type: none"> 1. Mission Command (\$45K) 2. Movement and Maneuver (\$90K) 3. Intelligence (\$36K) 4. Fires (\$3K) 5. Sustainment (\$42K) 					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) C08 / <i>Rapid Equipping Force</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
6. Protection (\$84K) The REF anticipates ATEC testing and evaluation cost of \$2.700million. The REF requires RDT&E funds to test technologies in order to ensure suitability and safety before equipping the Soldier – any modified COTS/GOTS/NDI item has to be tested.					
Accomplishments/Planned Programs Subtotals	3.907	3.259	3.162	3.000	6.162

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• M80101: <i>Rapid Equipping Soldier Support Equipment</i>	30.403	26.503	5.000	8.500	13.500	10.000	10.000	10.000	10.000	Continuing	Continuing
• 121018000: <i>Operations and Maintenance, Army, 121018000</i>	92.519	45.000	18.933	26.067	45.000	22.288	19.729	19.096	19.274	Continuing	Continuing

Remarks

D. Acquisition Strategy

The REF harnesses current and emerging technologies to provide rapid solutions to the urgently required capabilities of U.S. Army Forces employed globally. The REF focus is on rapidly placing capabilities into Soldiers' hands. This mission is accomplished in one of two ways: 1) rapidly adapting COTS/GOTS/NDI equipment to meet operational needs, and 2) developing emerging deployable capability via interaction with research and development organizations and academia. All capabilities are safety tested prior to insertion into operational environments. Training and sustainment are provided for every capability until it is transitioned to an approved acquisition program or terminated through an approved Army process. Operational assessments are conducted to provide feedback in support of Army requirements generation and future capability development. REF capabilities routinely serve as a bridge to specific ONS, JUONS, and JEONS gaps to meet urgent operational requirements.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>				Project (Number/Name) EL1 / <i>Army Field Feeding Programs</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EL1: <i>Army Field Feeding Programs</i>	-	1.108	1.948	0.447	-	0.447	0.992	0.504	1.246	1.421	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

2016 shall be the first funded year for the Army Field Feeding Programs Element.

A. Mission Description and Budget Item Justification

This project provides for the advanced component development and prototyping of Army food and combat feeding equipment designed to reduce the logistics burden and Operation and Support (O&S) costs of subsistence support to service personnel. Project supports development of rapidly deployable field food service equipment in coordination with ration development efforts. Project conducts demonstration and validation of improved subsistence support items used to enhance soldier effectiveness and quality of life in the Army and the other military services, as coordinated with the Department of Defense (DoD) Food Research, Development, Test, Evaluation and Engineering Program. This project develops critical enablers that support the Joint Future Force Capabilities and the Joint Expeditionary Mindset by maintaining readiness through fielding and integrating new equipment. This equipment enhances the field soldier's well-being and provides the soldier with usable equipment, in addition to reducing sustainment requirements, related Combat Support/Combat Service Support (CS/CSS) demands on lift, combat zone footprint, and costs for logistical support.

This PE/Project supports Field Feeding programs for the Army.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Battlefield Kitchen (BK) technology development effort	1.108	1.948	-	-	-
Description: Provide replacement of the obsolete Mobile Kitchen Trailer (MKT) system. The BK shall replace the MKT with a kitchen that provides fuel efficient, thermally controlled, closed combustion appliances within an environmentally controlled workspace. The BK shall provide rations for up to 300 Soldiers within 4 hours of setup. The BK provides refrigeration, running water and a heated serving line using the same off-road prime mover as the MKT as well as transportability by rail, sea, fixed and rotary wing aircraft.					
FY 2016 Accomplishments: Completed evaluation of appliances integrated with Jet Propellant 8 (JP-8) fired burners developed in the Science and Technology (S&T) phase as culmination of technology transfer agreement. Obtained approval					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) EL1 / <i>Army Field Feeding Programs</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
of milestone A/B program documentation from MDA. Awarded development contract that includes options for production. FY 2017 Plans: Complete transition of BK into Engineering and Manufacturing Development (EMD) phase. Complete design and build of BK component and subsystems. Initiate Integrated Logistics Support (ILS) development through the development contract.					
Title: Ethylene Control Device (ECD) for Multi Temperature Refrigerated Container System (MTRCS) Description: Develop a compact, low power, automated system that decomposes ethylene inside the MTRCS to extend the shelf life of fresh fruits and vegetables. The 300-watt ECD provides an average two week shelf life extension of fresh produce and can be operated independently or in unison with the MTRCS refrigeration system and can be permanently or temporarily mounted with no negative impact to the MTRCS storage capacity. (MTRCS Operational Requirements Document (ORD) approved Apr 2002). FY 2018 Base Plans: Transition mature ethylene control technology from the Navy and Army Science and Technology (S&T) into a functioning MTRCS. The MTRCS refrigeration system cycles on as needed and as such does not always supply power to the ECDs. The effectiveness of reduced ethylene control shall be evaluated by PM-FSS in a static setting without the use of actual rations. Parasitic power draw on the MTRCS electrical system, effects of added heat and weight shall be tested and evaluated for possible transition into the MTRCS Program of Record as an Engineering Change to fielded and newly produced MTRCS.	-	-	0.200	-	0.200
Title: Deployable Sustainable Efficient Refrigeration Technology (DESERT) Description: Develop enhanced refrigeration unit that uses a lower Global Warming Potential (GWP) refrigerant than the current MTRCS. The DESERT makes use of R-134A as the working fluid. R-134A has a GWP of ~1300 as compared to the current MTRCS refrigerant R404A which has a GWP of ~3900. The redesigned refrigeration unit offers greater fuel efficiency, operation at real sun/desert temperatures of 135F, increased reliability and the ability to make use of alternate power sources to augment efficiency. The DESERT refrigeration unit shall be backwards compatible to the MTRCS for continuing procurement and as a replacement. (MTRCS ORD approved Apr 2002). FY 2018 Base Plans:	-	-	0.247	-	0.247

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603747A / <i>Soldier Support and Survivability</i>	Project (Number/Name) EL1 / <i>Army Field Feeding Programs</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
The DESERT shall be transitioned from Army S&T to the EMD phase of development through a technology transition agreement. Breadboard systems have been developed and shall complete preliminary testing in FY17. Mature prototypes shall be procured in FY18 and inserted into used MTRCS to verify compatibility and evaluate initial performance.					
Accomplishments/Planned Programs Subtotals	1.108	1.948	0.447	-	0.447

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• RDT&E 654713.EL2: <i>Army Field Feeding Equipment</i>	0.320	1.295	3.002	-	3.002	3.179	4.207	2.865	2.032	Continuing	Continuing
• OPA M65806: <i>Assault Kitchen, Field Feeding</i>	3.964	7.750	4.608	-	4.608	4.129	4.565	6.145	6.268	Continuing	Continuing
• OPA M65801: <i>Refrigerated Container System</i>	10.354	7.459	10.877	-	10.877	13.660	11.165	15.253	14.137	Continuing	Continuing

Remarks

D. Acquisition Strategy

Project development will transition to System Development & Demonstration and into production after thorough testing.

E. Performance Metrics

N/A

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603766A / Tactical Electronic Surveillance System - Adv Dev
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	17.562	15.730	27.733	-	27.733	32.340	36.742	30.894	31.838	Continuing	Continuing
907: Tactical Exploitation Of National Capabilities-MIP	-	17.562	15.730	27.733	-	27.733	32.340	36.742	30.894	31.838	Continuing	Continuing

Note

All funding is in support of the ACTIVE COMPONENT

A. Mission Description and Budget Item Justification

The Tactical Exploitation of National Capabilities (TENCAP) program serves as the Army's centralized lead to perform National Intelligence cross-agency engineering to evaluate, enhance, prototype, and transition Intelligence, Surveillance, and Reconnaissance (ISR) technologies/capabilities developed by Science and Technology (S&T) and other activities across the National Intelligence Community (IC) into Army systems and architectures. TENCAP (1) ensures continued access to current National and Theater sensors and supporting tactical architectures; and (2) exploits new developments that focus on improving the analysis and tasking, collection, processing, exploitation, dissemination and feedback (TCPEDF) of intelligence data. This includes efforts to: (1) shorten targeting timelines down to Platoon level; (2) enhance target identification; (3) provide better target location (accuracy); (4) provide continued coverage of a target; and (5) develop in-theater analytic tools to enable data exploitation in near-real-time support to contingency operations.

B. Program Change Summary (\$ in Millions)

	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018 Base</u>	<u>FY 2018 OCO</u>	<u>FY 2018 Total</u>
Previous President's Budget	13.472	15.730	20.595	-	20.595
Current President's Budget	17.562	15.730	27.733	-	27.733
Total Adjustments	4.090	0.000	7.138	-	7.138
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	4.090	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	7.138	-	7.138

Change Summary Explanation

Fiscal Year (FY) 2016 increase is a result of Above Threshold Reprogramming (ATR) (April 16-20 PA) in support of EUCOM Joint Urgent Operational Needs Statement (JUONS)/USAEUR Operational Needs Statement 16-21429. Funds were required to provide Army Tactical Exploitation of National Capabilities (TENCAP) risk mitigation in support of Air Vigilance for the U.S. European Command (EUCOM) Area of Responsibility (AOR).

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>
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Fiscal Year (FY) 2018 increase is a result of a funds realignment to support New Signal Development in Air Vigilance (AV) and development of Advanced Miniaturized Data Acquisition System (AMDAS) Next.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>				Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities-MIP</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
907: <i>Tactical Exploitation Of National Capabilities-MIP</i>	-	17.562	15.730	27.733	-	27.733	32.340	36.742	30.894	31.838	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

All funding is in support of the ACTIVE COMPONENT

A. Mission Description and Budget Item Justification

The Tactical Exploitation of National Capabilities (TENCAP) program serves as the Army's centralized lead to perform National Intelligence cross-agency engineering to evaluate, enhance, prototype, and transition Intelligence, Surveillance and Reconnaissance (ISR) technologies/capabilities developed by Science and Technology (S&T) and other activities across the National Intelligence Community (IC) into Army systems and architectures. TENCAP (1) ensures continued access to current National and Theater sensors and supporting tactical architectures; and (2) exploits new developments that focus on improving the analysis and tasking, collection, processing, exploitation, dissemination and feedback (TCPEDF) of intelligence data. This includes efforts to: (1) shorten targeting timelines down to Platoon level; (2) enhance target identification; (3) provide better target location (accuracy); (4) provide continued coverage of a target; and (5) develop in-theater analytic tools to enable data exploitation in near-real-time support to contingency operations.

FY2018 Base funding in the amount of \$27.733 million provides for: (1) engineering and collaborative development on multiple validated National Intelligence Community (IC) advanced developments to ensure continuous Army interoperability with those IC assets and architectures; (2) advanced development of more effective intelligence collection, processing, exploitation and dissemination (PED); (3) Advanced Miniaturized Data Acquisition System (AMDAS) 'Next' sensor development; and (4) advanced development of signal capabilities for Air Vigilance (AV) Army Program of Record.

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

	FY 2016	FY 2017	FY 2018
Title: TENCAP Cross-agency Core Engineering activities	13.043	11.109	15.836
Description: Collaborate, develop and exploit emerging multi-intelligence and Space-based technologies to satisfy/accelerate Army Intelligence, Surveillance, Reconnaissance (ISR), Mission Command and Force Protection requirements.			
FY 2016 Accomplishments: Identified Army requirements in National developments; Ensured Army maintained access to sensors and Space-based capabilities; Monitored emerging technologies and systems; Exploited advances in commercial imagery and signal technologies; Developed prototypes that improved Army intelligence products.			
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities-MIP</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Identify Army requirements in National developments; Ensure Army maintains access to sensors and Space-based capabilities; Monitor emerging technologies and systems; Exploit advances in commercial imagery and signal technologies; Develop prototypes that improve Army intelligence products.</p> <p>FY 2018 Plans: Incorporate Army requirements into earliest stages of National developments; Ensure Army access to sensors and Space-based capabilities; Monitor emerging technologies and systems; Exploit advances in commercial imagery and signal technologies; Develop prototypes that improve Army intelligence products.</p>				
<p>Title: Air Vigilance - Advanced Development</p> <p>Description: Enhance intelligence, force protection, and indications and warning capabilities under Army TENCAP program.</p> <p>FY 2016 Accomplishments: Advanced signal development and enhancements for Air Vigilance (AV) Army Program of Record ingest and continued effectiveness.</p> <p>FY 2017 Plans: Advance signal development and enhancements for Air Vigilance (AV) Army Program of Record ingest, and continued effectiveness as additional sensors are fielded per basis of issue plan.</p> <p>FY 2018 Plans: Advance signal development and software enhancements for Air Vigilance (AV) Army Program of Record, and other similar follow-on prototype systems.</p>		0.515	0.530	5.802
<p>Title: Advanced Miniaturized Data Acquisition System(AMDAS)/ AMDAS Dissemination Vehicle (ADV)</p> <p>Description: AMDAS/ADV: Continued advanced engineering and development efforts to ensure continued interoperability and effectiveness of Army Corp-level TENCAP subsystems that provide national data to the tactical warfighter via intelligence community partners classified national systems.</p> <p>FY 2016 Accomplishments: AMDAS/ADV: Advanced sensor development and prototyping of TENCAP subsystems via new antenna studies and development of new ground station requirement and operational concepts to ensure alignment with national architecture enhancements as the National Technical Means (NTM) space-based capabilities progress</p> <p>FY 2017 Plans:</p>		4.004	4.091	6.095

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities-MIP</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
AMDAS/ADV: Advance sensor development and prototyping of TENCAP subsystems to ensure alignment with evolving national architectural enhancements as the National Technical Means (NTM) space-based capabilities progress.			
FY 2018 Plans: AMDAS Next: Advance sensor development and prototype TENCAP subsystems new antenna, and design ground processor, to ensure alignment with evolving national architectural enhancements as the National Technical Means (NTM) space-based capabilities progress.			
Accomplishments/Planned Programs Subtotals	17.562	15.730	27.733

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0605766A RDTE: <i>National Integration To Tactical Systems (MIP), 0605766A</i>	10.599	4.955	6.882	-	6.882	9.804	10.033	8.104	11.066	Continuing	Continuing
• W60001 OPA: <i>Air Vigilance (AV), OPA2 (W60001)</i>	8.224	0.733	5.348	-	5.348	6.497	6.953	5.169	8.530	Continuing	Continuing
• 122011 OMA: <i>Contractor Logistics Support and Other Weapon Support, OMA 122011</i>	-	-	2.029	-	2.029	2.070	2.111	2.153	2.196	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Army Tactical Exploitation of National Capabilities (TENCAP) mission is a Congressionally mandated and chartered enduring requirement to leverage National intelligence capabilities useful to the tactical Army. The Army TENCAP acquisition strategy is driven by an annual TENCAP General Officer Steering Group (TGOSG), co-chaired by the Army G2; Army G8; and the Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology [ASA(ALT)]; and includes representatives from the Army G3; Army G6; Army Training and Doctrine Command (TRADOC); and the Program Executive Office for Intelligence, Electronic Warfare and Sensors (PEO IEW&S). The TGOSG reviews, validates, prioritizes, and guides Army TENCAP efforts, according to Army and Defense strategy. Based on this TGOSG guidance, Army TENCAP invests BA 6.4 RDTE in Intelligence Community (IC) developments during the more cost-effective advanced development phase to ensure Army requirements are met with minimal redundancy. Army TENCAP then uses BA 6.5 RDTE to manage the transition of these advanced development efforts through system development and integration into Army Programs of Record (POR). This strategy ensures these leveraged investments remain viable through multiple budget cycles, significantly increasing successful transition to recipient Army POR. With acquisition discipline and oversight provided by PEO IEW&S, Army TENCAP executes the TGOSG approved efforts through use of multiple contracts and agreements with the military, National agencies, Labs, Industry Partners and Academia for the full duration required to complete development and transition these National capabilities into enduring Army programs.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities-MIP</i>

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603766A / Tactical Electronic Surveillance System - Adv Dev				907 / Tactical Exploitation Of National Capabilities-MIP							
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Intelligence Engineers (SETA)	C/ FFPLOE	TASC, Inc : Alexandria, VA	10.853	3.563	Jul 2016	4.115	Feb 2017	4.200	Feb 2018	-		4.200	Continuing	Continuing	Continuing
Intelligence Engineers(Matrix Gov)	MIPR	AGC : Alexandria, VA	3.775	1.028	Nov 2015	1.174	Jan 2017	1.280	Jan 2018	-		1.280	Continuing	Continuing	Continuing
Subtotal			14.628	4.591		5.289		5.480		-		5.480	-	-	-
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
TENCAP Core (Focus) Areas	Various	Multiple : Multiple	2.089	5.220	Dec 2015	3.782	Jan 2017	7.400	Jan 2018	-		7.400	Continuing	Continuing	0.000
Air Vigilance	MIPR	Classified : MIPR	2.728	0.515	Nov 2015	0.530	Jan 2017	5.802	Jan 2018	-		5.802	Continuing	Continuing	Continuing
AMDAS/ADV	MIPR	Classified : MIPR	3.500	4.004	Jan 2016	4.091	Jan 2017	6.095	Jan 2018	-		6.095	Continuing	Continuing	Continuing
Subtotal			8.317	9.739		8.403		19.297		-		19.297	-	-	-
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Prgm Mgmt-Dir Gov,travel,etc.	Allot	Army TENCAP : Alexandria, VA	8.349	2.156	Oct 2015	1.150	Jan 2017	2.076	Jan 2018	-		2.076	Continuing	Continuing	Continuing
Secured Facilities	MIPR	Army Geospatial : Ft. Belvoir, VA	1.568	0.656	Dec 2015	0.423	Jan 2017	0.455	Jan 2018	-		0.455	Continuing	Continuing	Continuing
Subtotal			9.917	2.812		1.573		2.531		-		2.531	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603766A / Tactical Electronic Surveillance System - Adv Dev					Project (Number/Name) 907 / Tactical Exploitation Of National Capabilities-MIP					
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Lab Tests, Exercises, Simulations	MIPR	Multiple : Multiple	0.500	0.420	Dec 2015	0.465	Jan 2017	0.425	Jan 2018	-		0.425	Continuing	Continuing	Continuing
Subtotal			0.500	0.420		0.465		0.425		-		0.425	-	-	-
Project Cost Totals			Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			33.362	17.562		15.730		27.733		-		27.733	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities-MIP</i>
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
CORE Cross-Agency Advanced Development and Engineering	Development with Nat Intel Community																											
(1) TENCAP General Officer Steering Group (TGOSG) - annual - guides					▲ 1																							
(2) TENCAP General Officer Steering Group (TGOSG) - annual - guides					▲ 2																							
(3) TENCAP General Officer Steering Group (TGOSG) - annual - guides					▲ 3																							
(4) TENCAP General Officer Steering Group (TGOSG) - annual - guides					▲ 4																							
(5) TENCAP General Officer Steering Group (TGOSG) - annual - guides					▲ 5																							
(6) TENCAP General Officer Steering Group (TGOSG) - annual - guides					▲ 6																							
(7) TENCAP General Officer Steering Group (TGOSG) - annual - guides					▲ 7																							
ADV Advanced Development and Engineering																												
AMDAS Next Studies																												
AMDAS Next Antenna Development																												
AMDAS Next Ground Processor Development																												
Air Vigilance Advanced Development and System prototype efforts																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603766A / <i>Tactical Electronic Surveillance System - Adv Dev</i>	Project (Number/Name) 907 / <i>Tactical Exploitation Of National Capabilities-MIP</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CORE Cross-Agency Advanced Development and Engineering	4	2006	1	2023
TENCAP General Officer Steering Group (TGOSG) - annual - guides FY19-23 POM	4	2016	4	2016
TENCAP General Officer Steering Group (TGOSG) - annual - guides FY20-24 POM	4	2017	4	2017
TENCAP General Officer Steering Group (TGOSG) - annual - guides FY21-25 POM	4	2018	4	2018
TENCAP General Officer Steering Group (TGOSG) - annual - guides FY22-26 POM	4	2019	4	2019
TENCAP General Officer Steering Group (TGOSG) - annual - guides FY23-27 POM	4	2020	4	2020
TENCAP General Officer Steering Group (TGOSG) - annual - guides FY24-28 POM	4	2021	4	2021
TENCAP General Officer Steering Group (TGOSG) - annual - guides FY25-29 POM	4	2022	4	2022
ADV Advanced Development and Engineering	2	2015	1	2023
AMDAS Next Studies	2	2015	1	2019
AMDAS Next Antenna Development	2	2017	1	2020
AMDAS Next Ground Processor Development	2	2018	1	2021
Air Vigilance Advanced Development and System prototype efforts	3	2013	1	2023

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603774A / Night Vision Systems Advanced Development							
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	7.003	10.321	12.347	-	12.347	8.435	6.779	6.828	7.451	Continuing	Continuing
VT7: Soldier Maneuver Sensors - Adv Dev	-	7.003	10.321	12.347	-	12.347	8.435	6.779	6.828	7.451	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element focuses on efforts to evaluate and integrate technologies and representative prototype systems that facilitate the development of Soldier-borne sensor devices transitioning from the laboratory to operational use. Efforts focus on proving out commonality across as broad a spectrum of users as possible to provide enhanced Soldier products, giving them superiority on the battlefield.

Project VT7 (Soldier Maneuver Sensors-Advanced Development): These efforts focus on providing enhanced products to give Soldiers superiority on the battlefield by providing the capability to detect enemy snipers using precise target information to mitigate operational risk before sniper fire occurs. This project integrates higher resolution thermal focal plane arrays, integrated ballistic solutions to auto-adjust reticles for range, wireless technology with weapon sights, improved range, performance, and capability, while decreasing system size and weight. These integration efforts enhance Soldier situational awareness, lethality, survivability, mobility, and comfort in combat and training environments. Additionally, this project supports efforts to evaluate and integrate technologies and representative prototype systems for the development of Soldier-borne sensor devices, transitioning from the Science and Technology (S&T) arena to operational use. This project includes cost associated with efforts for integration and interface of products on Soldiers head, body and weapons.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	7.292	10.321	13.856	-	13.856
Current President's Budget	7.003	10.321	12.347	-	12.347
Total Adjustments	-0.289	0.000	-1.509	-	-1.509
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.289	-			
• Adjustments to Budget Years	0.000	0.000	-1.509	-	-1.509

Change Summary Explanation

FY 2018 Funding was reduced by (1.509) million to reflect current program execution.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>				Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
VT7: <i>Soldier Maneuver Sensors - Adv Dev</i>	-	7.003	10.321	12.347	-	12.347	8.435	6.779	6.828	7.451	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

These efforts focus on providing enhanced products to give Soldiers superiority on the battlefield by providing the capability to detect enemy snipers using precise target information to mitigate operational risk before sniper fire occurs. This project integrates higher resolution thermal focal plane arrays, integrated ballistic solutions to auto-adjust reticles for range, wireless technology with weapon sights, improved range, performance, and capability, while decreasing system size and weight. These integration efforts enhance Soldier situational awareness, lethality, survivability, mobility, and comfort in combat and training environments. Additionally, this project supports efforts to evaluate and integrate technologies and representative prototype systems for the development of Soldier-borne sensor devices, transitioning from the Science and Technology (S&T) arena to operational use. This project includes cost associated with efforts for integration and interface of products on Soldiers head, body and weapons.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Family of Weapon Sights (FWS)	4.060	-	-	-	-
Description: FWS is a family of weapon sights that enable combat forces to acquire and engage targets with small arms and to conduct surveillance and Enhanced Target Engagement under day/night obscuration, no-light, and adverse weather conditions. The family utilizes advancements in thermal and low light level sensors to produce Individual (I), Crew-Served (CS), and Sniper (S) weapon sights operable in-line with a day optic or in stand-alone mode. This project integrates a smaller pixel focal plane array in multiple large format sizes to improve sensitivity, clarity, and range, while simultaneously reducing the size, weight and power consumption of both the Crew-Served and Sniper variants. The FWS-I variant is a weapon mounted long-wave infrared sensor that enables Soldiers to fire quickly and accurately from any carry position and with significantly reduced exposure to enemy fire by providing a wireless zeroed weapon aim point in the Soldier's goggle. Leveraging the success of the Individual variant development, the FWS-CS variant operates as the primary sight; it includes a wireless Helmet Mount Display (HMD) and provides the Soldier, with input from a laser rangefinder device, a more accurate aim point that adjusts automatically for range, ammunition characteristics, and vertical angle. The FWS-S variant mounts in-line with the Sniper's direct view optic providing a thermal imagery capability to the host weapon at the weapon's maximum effective range, plus 20% overmatch. FWS-S provides Snipers a large format display with increased pixel density that enables accurate long range engagements while maintaining day sight, extending the lethality and providing exceptional observation.					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p><i>FY 2016 Accomplishments:</i> Completed Technology Maturation Risk Reduction (TMRR) phase for the FWS-CS and FWS-S. Prepared and released Request for Proposals (RFPs) and conduct source selection boards for FWS-CS and FWS-S Engineering and Manufacturing Development (EMD) contract awards. Improved the manufacturing process for uncooled Focal Plane Arrays (FPAs) and micro Optical Light Emitting Diode (OLED) displays that are key components of the FWS.</p>					
<p><i>Title:</i> Family of Vision and Mobility Capabilities (FVMC) <i>Description:</i> The FVMC is the next generation vision system for day and night that will reduce the Soldier's burden and allow hands free operation. The FVMC will provide automatic adjustment of imagery and matched sensor fields of view. The FVMC will provide day/night Rapid Target Acquisition (RTA) capability by interfacing with FWS-I, day/night data display for the Soldier Network Warrior End User Device/Computer (EUD), and ability to send/receive data to the EUD to support advanced EUD applications to process the sensor video, integrate it with external data sources, and produced advanced processed imagery with overlay data display.</p>	-	8.151	10.374	-	10.374
<p><i>FY 2017 Plans:</i> Continue development efforts of the FVMC focusing at the component level.</p> <p><i>FY 2018 Base Plans:</i> Continue development of components algorithms and demonstrators in support of providing FVMC.</p>					
<p><i>Title:</i> Pre-Shot Threat Detection (PTD) <i>Description:</i> The PTD system is a compact, lightweight, mounted multi-function laser system designed to detect threat Snipers, Forward Observers and Scouts equipped with direct view optics. The PTD functions include laser illumination, optical augmentation and pointing.</p> <p>The PTD capabilities will be developed in two parallel paths to allow for technology insertions when available. PTD (Overt) provides the maneuver element with an initial solution (overt) that improves the Soldier's capability to conduct pre-shot threat detection, obtain situational awareness, and verification of threat. PTD combines the capability of the Multi-Function Aiming Light and the Green Laser Interdiction System, thereby reducing redundancy and the total load. PTD (Covert) provides the maneuver element with an enhanced solution (covert) that improves the Soldier's capability to conduct pre-shot threat detection, obtain situational awareness,</p>	2.943	2.170	1.973	-	1.973

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
verification of the threat and initiate appropriate threat reduction actions all while remaining undetected by enemy optics.					
<i>FY 2016 Accomplishments:</i> Continued TMRR and began PTD component development and laser development. Completed funding for PTD technology demonstrators.					
<i>FY 2017 Plans:</i> Develop covert capability. Research and test suitable imagers for covert functionality.					
<i>FY 2018 Base Plans:</i> Continue development of covert components functionality.					
Accomplishments/Planned Programs Subtotals	7.003	10.321	12.347	-	12.347

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• Night Vision Systems -Eng Dev: <i>Night Vision Systems - Eng Dev (PE 604710 L67)</i>	19.710	26.257	32.504	-	32.504	23.355	19.649	19.343	19.200	Continuing	Continuing
• Helmet Mounted Enhanced Vision Devi: <i>Helmet Mounted Enhanced Vision Devices (HMEVD) (SSN K36400)</i>	92.533	156.197	144.617	0.027	144.644	120.989	91.640	43.111	33.076	Continuing	Continuing
• Family of Weapon Sights (FWS) - I: <i>Family of Weapon Sights - Individual (FWS-I) (SSN K22002)</i>	30.194	55.536	49.887	-	49.887	89.769	83.246	80.685	19.900	Continuing	Continuing
• Family of Weapon Sights (FWS) - CS: <i>Family of Weapon Sights - Crew Served (FWS-CS) (SSN K22003)</i>	-	-	1.033	-	1.033	31.469	78.822	86.403	95.575	Continuing	Continuing
• Family of Weapon Sights (FWS) - S: <i>Family of Weapon Sights - Sniper (FWS-S) (SSN K22004)</i>	-	-	8.185	-	8.185	15.753	26.467	16.555	1.728	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

D. Acquisition Strategy

The various developmental programs in this project continue to exercise competitively awarded contracts using best value source selection procedures.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>
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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	Various : Various	3.214	0.851	Feb 2016	1.018	Feb 2017	0.565	Feb 2018	-		0.565	Continuing	Continuing	0.000
Subtotal			3.214	0.851		1.018		0.565		-		0.565	-	-	0.000

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Family of Weapon Sights-Crew Served (FWS-CS)	Various	NVESD : FT BELVOIR, VA	8.259	2.500	Feb 2016	-		-		-		-	0.000	10.759	0.000
Family of Weapon Sights-Sniper (FWS-S)	MIPR	NVESD : FT BELVOIR, VA	5.840	0.547	Dec 2016	-		-		-		-	0.000	6.387	0.000
Family of Vision and Mobility Capabilities (FVMC)	MIPR	NVESD : FT BELVOIR, VA	0.000	-		7.033	Dec 2016	9.309	Feb 2018	-		9.309	Continuing	Continuing	0.000
Pre-Shot Threat Detection (PTD)	MIPR	NVESD : FT BELVOIR, VA	2.848	2.610	Jun 2016	1.170	Jan 2017	1.973	Dec 2017	-		1.973	Continuing	Continuing	0.000
Subtotal			16.947	5.657		8.203		11.282		-		11.282	-	-	0.000

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Matrix Support	MIPR	NVESD : FT BELVOIR, VA	1.076	0.495	Feb 2016	1.100	Dec 2016	0.500	Feb 2018	-		0.500	Continuing	Continuing	0.000
Subtotal			1.076	0.495		1.100		0.500		-		0.500	-	-	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army													Date: May 2017		
Appropriation/Budget Activity 2040 / 4						R-1 Program Element (Number/Name) PE 0603774A / Night Vision Systems Advanced Development				Project (Number/Name) VT7 / Soldier Maneuver Sensors - Adv Dev					

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Support Test Activity	MIPR	Army Test and Evaluation Command : Various	0.600	-		-		-		-		-	Continuing	Continuing	0.000
Subtotal			0.600	-		-		-		-		-	-	-	0.000
Project Cost Totals			21.837	7.003		10.321		12.347		-		12.347	-	-	0.000

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
FWS-CS/S Technology Maturation Risk Reduction (TMRR)	TMRR																											
(1) FWS-CS MS B	MS B																											
(2) FWS-S MS B	MS B																											
Family of Vision and Mobility Capabilities (FVMC)	Development																											
(3) PTD MS A	MS A																											
Overt PTD TMRR	TMRR																											
Overt PTD Test and Evaluation (T&E)									T&E																			
(4) PTD MS C													MS C															
(5) NEXT GENERATION SMART SENSOR (NGSS) MS A																	MS A											
NGSS TMRR									TMRR																			
Covert Development									Development																			

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603774A / <i>Night Vision Systems Advanced Development</i>	Project (Number/Name) VT7 / <i>Soldier Maneuver Sensors - Adv Dev</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FWS-CS/S Technology Maturation Risk Reduction (TMRR)	4	2011	3	2016
FWS-CS MS B	3	2016	3	2016
FWS-S MS B	3	2016	3	2016
Family of Vision and Mobility Capabilities (FVMC)	3	2013	4	2020
PTD MS A	2	2016	2	2016
Overt PTD TMRR	3	2016	1	2017
Overt PTD Test and Evaluation (T&E)	4	2017	1	2018
PTD MS C	3	2018	3	2018
NEXT GENERATION SMART SENSOR (NGSS) MS A	1	2020	1	2020
NGSS TMRR	1	2018	3	2018
Covert Development	1	2018	3	2018

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603779A / Environmental Quality Technology - Dem/Val							
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	8.464	7.785	10.456	-	10.456	11.727	11.403	11.512	10.781	Continuing	Continuing
035: National Defense Cntr For Enviro Excellence	-	2.666	2.548	3.779	-	3.779	4.003	3.906	3.982	3.926	Continuing	Continuing
E21: POLLUTION PREVENTION TECHNOLOGY DEM/VAL	-	5.798	5.237	6.677	-	6.677	7.724	7.497	7.530	6.855	Continuing	Continuing

A. Mission Description and Budget Item Justification

There is a broad application potential for environmental quality technology (EQT) to be applied to multiple Army weapon systems and installations. However, technology must be demonstrated and validated (total ownership cost and performance data identified) before potential users will consider exploiting it. This Program Element includes Projects focused on validating the general military utility or cost reduction potential of technology when applied to different types of infrastructure, military equipment or techniques. It may include validations and proof-of-principle demonstrations in field exercises to evaluate upgrades or provide new operational capabilities. The validation of technologies will be in as realistic an operating environment as possible to assess performance or cost reduction potential. EQT demonstration/validation is systemic, i.e. applies to a class of systems (e.g., vehicles or aircraft) or to a Department of Army-wide, multiple site/installation problem (e.g. unexploded ordnance detection and discrimination). This PE will address, and eventually resource, programs in each of the Army environmental quality technology pillars (military materials in the environment, sustainable ranges and lands, compliance, and pollution prevention). All work must be endorsed by potential users and supported by a state-of-the-art assessment (i.e. "technology is heading for user to implement").

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	8.813	7.785	8.213	-	8.213
Current President's Budget	8.464	7.785	10.456	-	10.456
Total Adjustments	-0.349	0.000	2.243	-	2.243
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.349	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	2.243	-	2.243

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	
Change Summary Explanation FY 2018 increase of \$2.243M: \$0.4M in support of National Defense Center for Environmental Excellence; \$1.8M in support of Pollution Prevention Technology Dem/Val efforts.		

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>				Project (Number/Name) 035 / <i>National Defense Cntr For Enviro Excellence</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
035: <i>National Defense Cntr For Enviro Excellence</i>	-	2.666	2.548	3.779	-	3.779	4.003	3.906	3.982	3.926	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The National Defense Center for Environmental Excellence (NDCEE) was established by Congress in 1990 with a directive to "serve as a national leadership organization to address high priority environmental problems for the Department of Defense (DoD), other government organizations, and the industrial community." The NDCEE Program is a national resource for developing and disseminating advanced environmental technologies. The NDCEE is used to: demonstrate environmentally acceptable technology to industry; validate new technology prior to transferring that technology; and assist in the training of potential users as part of that technology transfer process. The NDCEE is a DoD resource for environmental quality management and technology validation. This Project is managed by the Army on behalf of the Office of the Assistant Deputy Under Secretary of Defense for Installations & Environment. In May 2008, the Project name was redesignated from the National Defense Center for Environmental Excellence to the National Defense Center for Energy and Environment to ensure that the Center's mission recognizes and addresses the strategic interdependence of energy and environmental technology requirements within an overall sustainability framework in support of our installations, weapons systems and war fighters. This name change also directly supports the DoD's proactive implementation of Executive Order 13423, "Strengthening Federal Environmental, Energy and Transportation Management."

The United States (U.S.) Army's broadly encompassing and growing mobile, personal and stationary advanced energy technology requirements include infrastructure, alternative and synthetic fuels, surety, renewables, storage, distribution, advanced power, micro-grids, transportation, systems integration and others. Further, to train as we fight, validated energy and environmental technologies need to be available and implemented at Army installations. The NDCEE will continue to demonstrate, validate, and transfer these technologies supporting our integrated environment, safety, occupational health and energy objectives with full consideration of the triple bottom line of mission, environment and community.

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

	FY 2016	FY 2017	FY 2018
Title: Conduct demonstration/validation of environmentally acceptable technologies that enhance military readiness and reduce production, operating, and/or disposal costs.	2.329	1.569	2.935
Description: Supports the demonstration and validation of environmental, safety, occupational health, and energy technologies that support the Army's Environmental Quality Technology mission. The objective is to determine if the technology is ready for implementation that will enhance military readiness and reduce production, operating, and/or disposal costs.			
FY 2016 Accomplishments:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) 035 / <i>National Defense Cntr For Enviro Excellence</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Conducted demonstration/validation of environmentally acceptable technologies that enhance military readiness and reduce production, operating, and/or disposal costs. Technologies demonstrated consisted of technologies selected by the NDCEE Technical Working Group.</p> <p>FY 2017 Plans: Conduct demonstration/validation of environmentally acceptable technologies that enhance military readiness and reduce production, operating, and/or disposal costs. Technologies to be demonstrated consist of technologies selected by the NDCEE Technical Working Group and approved by the NDCEE Executive Advisory Board.</p> <p>FY 2018 Plans: Will conduct demonstration/validation of ESOH and Energy technologies that enhance military readiness and reduce production, operating, and/or disposal costs. Conduct project selection process for potential Fiscal Year (FY) 19 new starts. Technologies will be selected by the NDCEE Technical Working Group and approved by the NDCEE Executive Advisory Board.</p>				
<p>Title: NDCEE Government program management during contract negotiations and during project formulation, execution, and technology transfer.</p> <p>Description: Funds the government program management office for the NDCEE. This consists of personnel assisting in contract negotiations and during project formulation, execution, and technology transfer.</p> <p>FY 2016 Accomplishments: Funded NDCEE government program management during contract negotiations and during project formulation, execution, and technology transfer.</p> <p>FY 2017 Plans: Fund NDCEE Government program management during contract negotiations and during project formulation, execution, and technology transfer.</p> <p>FY 2018 Plans: Will fund NDCEE Government program management during contract negotiations and project formulation, execution, and technology transfer.</p>		0.337	0.979	0.844
Accomplishments/Planned Programs Subtotals		2.666	2.548	3.779
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) 035 / <i>National Defense Cntr For Enviro Excellence</i>

D. Acquisition Strategy

The NDCEE is a national asset focused on DoD applications that include technology transfer to appropriate DoD organizations. The NDCEE fosters an outreach program to describe its products and capabilities that include publication of results and participation in professional meetings, symposia, conferences, and appropriate coordination with industry. The management strategy for the NDCEE centers on a DoD Executive Advisory Board (EAB) chaired by the DoD NDCEE Executive Agent on behalf of the Deputy Undersecretary of Defense for Installations and Environment and composed of senior DoD leadership to oversee NDCEE operations. The EAB is supported by the NDCEE Technical Working Group (TWG) that includes senior level staff members from each of the offices represented on the EAB. The NDCEE TWG coordinates all NDCEE activities, votes on proposed joint NDCEE projects, and reports back to the EAB Principals. Working at the tactical levels, three Focus Groups (environment, safety/occupational health, and energy) were established to develop joint projects. The Army's Environmental Quality Technology Program participating in the Focus Groups also assists in the formulation of suggested environmental technology projects to be demonstrated within the NDCEE Program. The contracting strategy of the NDCEE is based on using an NDCEE Contracting Officer's Representative to validate all the contractual portions of the NDCEE and by technical monitors (TM) to oversee the technical aspects of each contracted task. A prime contractor operates NDCEE test facility to validate environmentally compatible technologies on a representative "shop floor". The NDCEE accounts for and conducts work for: (1) direct funded Army tasks; (2) reimbursable tasks from within DoD and from other Government agencies; and (3) when applicable Congressionally directed and funded tasks.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>				Project (Number/Name) E21 / <i>POLLUTION PREVENTION TECHNOLOGY DEM/VAL</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
E21: <i>POLLUTION PREVENTION TECHNOLOGY DEM/VAL</i>	-	5.798	5.237	6.677	-	6.677	7.724	7.497	7.530	6.855	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project supports Advanced Component Development and Prototypes of environmental quality technologies developed within the Army Environmental Quality Technology program. The Project increases operational sustainment and warfighter training capabilities by reducing soldier and worker health risks and environmental quality impacts that would otherwise result in restoration needs and compliance enforcement actions against installations while simultaneously increasing performance and standardization across the Army. The Project expedites technology transition from the laboratory to operational use by demonstrating new materials and processes to fulfill the performance requirements outlined in Material Specifications, Depot Maintenance Work Requirements, Technical Manuals, Drawings and other technical data. Materials and processes demonstrated under this project are inherently more sustainable than the baseline with respect to environmental, safety and occupational health concerns, thereby reducing life cycle costs incurred by acquisition, industrial base and installation end users.

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

	FY 2016	FY 2017	FY 2018
Title: Environmental quality technology demonstration and validation: Toxic Metal Reduction in Surface Finishing of Army Weapon Systems	2.843	2.150	2.628
Description: Increase readiness and environmental sustainability of Army depots and maintenance facilities by reducing or eliminating the use of hexavalent chromium, cadmium and associated toxic or carcinogenic materials used in surface finishing processes.			
FY 2016 Accomplishments: Conducted large-scale demonstrations of sustainable alternatives for conversion coating, surface activation and copper/silver electroplating processes.			
FY 2017 Plans: Conduct qualification testing for alternatives products in mixed metal pretreatment, conversion coating and surface activation applications.			
FY 2018 Plans: Will establish hexavalent chromium-free pilot processes for depositing and repairing hard chrome surfaces; will validate alternative products for sealing black oxide, hard anodize and zinc plated surfaces at Army depots.			
Title: Environmental quality technology demonstration and validation: Airborne Lead Reduction from Army Weapon Systems	1.825	1.600	1.277

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) E21 / <i>POLLUTION PREVENTION TECHNOLOGY DEM/VAL</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Description: Sustain soldier training readiness and ensure compliance at Army installations by reducing or eliminating the use of lead compounds in rocket and missile propellants and primary explosives (primers/detonators/initiators).</p> <p>FY 2016 Accomplishments: Qualified a promising lead-free primary explosive composition and will demonstrate a lead-free percussion primer in a relevant end item configuration.</p> <p>FY 2017 Plans: Demonstrate a green, improved process for loading lead-free primers and will scale up formation of a reduced-lead alternative to current extruded rocket propellants.</p> <p>FY 2018 Plans: Will load lead-free primers into relevant end items using new pilot-scale automated process and conduct initial performance testing; will conduct flight testing for rocket systems utilizing reduced-lead extruded rocket propellants.</p>				
<p>Title: Environmental quality technology demonstration and validation: ESOH Impacts of Short-Term Noise Assessment Procedures</p> <p>Description: Demonstrate and validate the technologies, including the underlying computational algorithms, for the impact of short-term noise assessment procedures on environmental footprint and Soldier readiness. When completed the program will: 1) have validated short-term noise assessment procedures, including uncertainty metrics and 2) have on-line, self-guided training modules for Sustainable Range Program range officers on performing and interpreting short-term noise assessment results.</p> <p>FY 2016 Accomplishments: Incorporated community response blast noise metrics into all short-term noise assessment tools. Incorporated and validated single event metrics and thresholds determined in the Blast Noise study into the noise models. Validated that single event propagation tables are properly and consistently accessed by each noise model to be tested. Used existing validation sets (Ft. Sill and Ft. Knox), initiated validation that all models produced identical results for each of the test cases. Demonstrated an initial methodology for automating simulations, given source and propagation condition inputs for future model update validations testing. Compared and validated model outputs for the Long-Range Sound Propagation dataset, treating the desert and temperate environments separately.</p> <p>FY 2017 Plans:</p>		0.570	0.586	0.625

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) E21 / <i>POLLUTION PREVENTION TECHNOLOGY DEM/VAL</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Incorporate community response blast noise metrics into all short-term noise assessment tools. Conduct comparisons and validation of models using installation validation sets (Ft. Sill and Ft. Knox). Initiate comparisons and validations of models using additional installation dataset (Ft. AP Hill). Design sampling protocols and methods.</p> <p>FY 2018 Plans: Will complete analysis of all datasets including any updates indicated by the demonstration / validation results. Test model updates to ensure continued accuracy and document the updates / validation results. Initiate developments of training modules for range managers.</p>				
<p>Title: Environmental quality technology demonstration and validation: Advanced Water Reuse Technology for Fixed Installations</p> <p>Description: Demonstrate and validate advanced water reuse technology for fixed installations and assess ESOH impacts. At the completion of this program, the following will be accomplished: 1) demonstration of energy efficient advanced water reuse technology at installations, 2) ESOH analysis of three water reuse technologies for installations including shower water recycling, distributed water reclamation, and centralized reclamation; 3) reports on best practices for permitting, design, and safe operation of advanced reuse technologies; and 4) marketing materials comparing quality of advanced reuse water to tap and bottled water to support technology adoption campaigns at installations and contingency bases.</p> <p>FY 2016 Accomplishments: Performed analysis of toxicity and full suite of potential water contaminants (Disinfection By-Products, Pentachlorophenol, viruses, Total Organic Carbon) at Technology Enabled Capabilities Demonstration sites and at active Environmental Security Technology Certification Program demonstration sites; supported permitting of advanced water reuse technology demonstration; and contracted for a demonstration/validation system prototype.</p> <p>FY 2017 Plans: Perform analysis of toxicity and full suite of potential water contaminants (Disinfection By-Products, Pentachlorophenol, viruses, Total Organic Carbon) at Technology Enabled Capabilities Demonstration sites and at active Environmental Security Technology Certification Program demonstration sites; support permitting of advanced water reuse technology demonstration; and develop a demonstration/validation system prototype.</p> <p>FY 2018 Plans: Will execute demonstration testing at Tobyhanna Weapons Depot, Fort Riley and Fort Carson. Demonstrations will include measurements of technology performance with a focus on removal of emerging micro-pollutants to guide ESOH analysis in coordination with Army Public Health Center (APHC).</p>		0.560	0.901	0.572
<p>Title: Environmental quality technology demonstration and validation: Insensitive Munitions Wastewater Treatment</p>		-	-	1.575

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603779A / <i>Environmental Quality Technology - Dem/Val</i>	Project (Number/Name) E21 / <i>POLLUTION PREVENTION TECHNOLOGY DEM/VAL</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Description: Demonstrate and validate optimized scalable wastewater treatment system basic technology for the destructive treatment of existing and emerging insensitive munitions (IM) contaminated production wastewater generated during Army ammunition plant munitions production.</p> <p>FY 2018 Plans: Will demonstrate new IMX production process wastewater remediation technology to allow efficient, low cost destruction of harmful and regulated contaminants for increased surface water discharge. Technology will allow increased production rates of munitions compounds while meeting permit regulatory thresholds for wastewater discharge.</p>			
Accomplishments/Planned Programs Subtotals	5.798	5.237	6.677

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0605857A 06l: <i>Pollution Prevention Tech Support</i>	0.262	0.110	0.710	-	0.710	1.055	0.681	0.652	0.496	Continuing	Continuing

Remarks

D. Acquisition Strategy
The project ultimately transitions successfully demonstrated environmental quality technologies to Army acquisition, industrial base and installation end users. As part of the Army's Environmental Quality Technology Program, all technology efforts address a valid Army Environmental Requirements and Technology Assessments (AERTA) requirement. The Army's Environmental Technology Integrated Product Team conducts a thorough assessment and makes funding recommendations to senior Army environmental leadership. Efforts approved by senior Army environmental leadership receive Advanced Component Development and Prototype funding to fully demonstrate and validate the technology for transition to end users for follow on implementation.

E. Performance Metrics
N/A

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0603790A / NATO Research and Development							
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	5.835	2.300	2.588	-	2.588	3.127	3.016	2.865	2.790	Continuing	Continuing
691: NATO Rsch & Devel	-	5.835	2.300	2.588	-	2.588	3.127	3.016	2.865	2.790	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) implements the provisions of Title 10 United States (US) Code, Section 2350a, Cooperative Research and Development (R&D) Projects: Allied Countries. The objective is to improve, through the application of emerging technologies, the conventional defense capabilities of the United States and our cooperative partners, including the North Atlantic Treaty Organization (NATO), US major non-NATO allies and Friendly Foreign countries. Through technology sharing and joint equipment development these projects help reduce US acquisition costs and leverage important technologies for the Army Transformation and the development of the Future Combat system. Cooperative efforts also improve multinational force compatibility with potential coalition partners through the development and use of similar equipment and improved interfaces. The program focuses specifically on international cooperative technology demonstration, validation, and interoperability of Army weapon and command, control, communications and information (C3I) systems, including the NATO Defense Against Terrorism initiatives. Projects are implemented through international agreements with foreign partners that define scope, cost and work sharing arrangements, management, contracting, security, data protection and third party transfers. Funds are used to pay for only the US work share that occurs in the United States at US Government and US contractor facilities.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	6.075	2.300	3.128	-	3.128
Current President's Budget	5.835	2.300	2.588	-	2.588
Total Adjustments	-0.240	0.000	-0.540	-	-0.540
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.240	-			
• Adjustments to Budget Years	0.000	0.000	-0.540	-	-0.540

Change Summary Explanation

Fiscal Year 2018 reduction due to inflation adjustments and other Economic Assumptions.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development				Project (Number/Name) 691 / NATO Rsch & Devel			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
691: NATO Rsch & Devel	-	5.835	2.300	2.588	-	2.588	3.127	3.016	2.865	2.790	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project implements the provisions of Title 10 U.S. Code, Section 2350a, Cooperative Research and Development (R&D) Projects: Allied Countries. The objective is to improve, through the application of emerging technologies, the conventional defense capabilities of the United States and our cooperative partners, including the North Atlantic Treaty Organization (NATO), U.S. major non-NATO allies and Friendly Foreign countries. Through technology sharing and joint equipment development these projects help reduce U.S. acquisition costs and leverage important technologies for the Army Transformation and the development of the Future Combat system. Cooperative efforts also improve multinational force compatibility with potential coalition partners through the development and use of similar equipment and improved interfaces. The Project focuses specifically on international cooperative technology demonstration, validation, and interoperability of Army weapon and command, control, communications and information (C3I) systems, including the NATO Defense Against Terrorism initiatives. Activities are implemented through international agreements with foreign partners that define scope, cost and work sharing arrangements, management, contracting, security, data protection and third party transfers. Funds are used to pay for only the U.S. work share that occurs in the United States at U.S. Government and U.S. contractor facilities.

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

	FY 2016	FY 2017	FY 2018
Title: Armaments Cooperation Enterprise Support	1.763	1.760	1.979
Description: Armaments Cooperation Enterprise Support/ International Online (IOL) Development and Implementation NATO/ International Cooperative R&D (AR 70-41) and International Acquisition (AR 70-1, AR 70-3). Prior to FY15, efforts in this area were covered under the area entitled Scientific and Technology Enterprise Management.			
FY 2016 Accomplishments: The goal of this activity is to expand worldwide allied standardization and interoperability through cooperative Research and Development (R&D) and technology sharing per SECDEF guidance and especially in support of the U.S. Army. This program will fund the travel costs and administrative support (studies, analysis, interpretation, equipment, etc.) required to participate internationally, such as the North Atlantic Treaty Organization (NATO) Army Armaments Group (NAAG), Defense Against Terrorism (DAT) and to pursue new cooperative R&D initiatives and international cooperative agreements such as memoranda of understanding. Additional funds will allow the coordination for cooperative research, development and evaluation of defense technologies/systems/equipments plus joint production and follow-on support of defense systems or equipment and the procurement of foreign technologies.			
FY 2017 Plans: The goal of this activity is to expand worldwide allied standardization and interoperability through cooperative Research and Development (R&D) and technology sharing per SECDEF guidance and especially in support of the U.S. Army. The execution			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>AR 70-41 responsibilities requires DASA (DE&C) to conduct engagement with key strategy foreign partners in all regions of the world through the SNR(A) program, international agreement negotiations, and other bilateral and multilateral forums involving DASA (DE&C) personnel. This program will fund the travel costs and administrative support (studies, analysis, interpretation, equipment, etc.) required to participate internationally, such as the North Atlantic Treaty Organization (NATO) Army Armaments Group (NAAG), Defense Against Terrorism (DAT) and to pursue new cooperative R&D initiatives and international cooperative agreements such as memoranda of understanding. Funds will allow the coordination for cooperative research, development and evaluation of defense technologies/systems/equipments plus joint production and follow-on support of defense systems or equipment and the procurement of foreign technologies.</p> <p>FY 2018 Plans: The goal of this activity is to expand worldwide allied standardization and interoperability through cooperative Research and Development (R&D) and technology sharing per SECDEF guidance and especially in support of the U.S. Army. The execution AR 70-41 responsibilities requires DASA (DE&C) to conduct engagement with key strategy foreign partners in all regions of the world through the SNR(A) program, international agreement negotiations, and other bilateral and multilateral forums involving DASA (DE&C) personnel. This program will fund the travel costs and administrative support (studies, analysis, interpretation, equipment, etc.) required to participate internationally, such as the North Atlantic Treaty Organization (NATO) Army Armaments Group (NAAG), Defense Against Terrorism (DAT) and to pursue new cooperative R&D initiatives and international cooperative agreements such as memoranda of understanding. Funds will allow the coordination for cooperative research, development and evaluation of defense technologies/systems/equipments plus joint production and follow-on support of defense systems or equipment and the procurement of foreign technologies.</p>			
<p>Title: Communications Interoperability, and Electronics Technologies</p> <p>Description: The goal of this activity is to develop technologies that enable interoperability among partner countries' command, control, communications, sensors, and information systems. Efforts include development of a single solution standard avoiding development of multiple unique solutions and leverage existing interoperability standards developed by NATO. Such standards include common doctrine, technical and procedural specifications to make better use of existing information, shared data, leveraged national operating picture capabilities and enable the development of interoperability of data, databases, applications, security domains and national networks architectures. Includes efforts from areas formerly titled Multi-National Network Enabled Capabilities, Low Level Air Defense Interoperability, JTRS, Combat Identification, and Multilateral Interoperability Program.</p> <p>FY 2016 Accomplishments: The goal of this activity is to develop technologies that enable interoperability among partner countries' command, control, communications, sensors, and information systems. Efforts include development of a single solution standard avoiding development of multiple unique solutions and leverage existing interoperability standards developed by NATO. Such standards include common doctrine, technical and procedural specifications to make better use of existing information, shared data,</p>	1.288	0.125	0.141

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Devel		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>leverage national operating picture capabilities and enable the development of interoperability of data, databases, applications, security domains and national networks architectures. Includes projects formerly titled Multi-National Network Enabled Capabilities, Low Level Air Defense Interoperability, JTRS, Combat Identification, and Multilateral Interoperability Program.</p> <p>FY 2017 Plans: The goal of this activity is to develop technologies that enable interoperability among partner countries' command, control, communications, sensors, and information systems. Efforts include development of a single solution standard avoiding development of multiple unique solutions and leverage existing interoperability standards developed by NATO. Such standards include common doctrine, technical and procedural specifications to make better use of existing information, shared data, leverage national operating picture capabilities and enable the development of interoperability of data, databases, applications, security domains and national networks architectures. FY17 funding will be used to pursue cooperative projects that were postponed such as: the Coalition Wideband Networking Waveform Phase II, 5-Power-Net-centric Command and Control Interoperability projects.</p> <p>FY 2018 Plans: The goal of this activity is to develop technologies that enable interoperability among partner countries' command, control, communications, sensors, and information systems. Efforts include development of a single solution standard avoiding development of multiple unique solutions and leverage existing interoperability standards developed by NATO. Such standards include common doctrine, technical and procedural specifications to make better use of existing information, shared data, leverage national operating picture capabilities and enable the development of interoperability of data, databases, applications, security domains and national networks architectures. FY18 funding will be used to pursue cooperative projects that were postponed such as: the Coalition Wideband Networking Waveform Phase II, 5-Power-Net-centric Command and Control Interoperability projects.</p>				
<p>Title: Senior National Representatives (Army) (SNR-(A))</p> <p>Description: Senior National Representatives (Army) (SNR-(A)) Projects (Partners: France, Germany, United Kingdom and Italy): Supports harmonization of programs at various levels: exchanging information, identifying knowledge gaps and conducting feasibility studies to further promote cooperative development; standardizing, fielding and roadmapping various processes; distributing the workload among the different nations. Technology Demonstrations hosted by the U.S. reps to Land Group 6, NATO Army Armaments Group (NAAG), will provide an opportunity to observe and demonstrate the current and future capability of participating NATO nations with a view to assisting future operational and materiel interoperability. Army support of NAAG studies, analysis and technology demonstrations.</p> <p>FY 2016 Accomplishments:</p>		0.144	0.013	0.015

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

	FY 2016	FY 2017	FY 2018
<p>Senior National Representatives (Army) (SNR-(A)) Projects with international partner will support harmonization of programs at various levels: exchanging information, identifying knowledge gaps and conducting feasibility studies to further promote cooperative development; standardizing, fielding and road mapping various processes; distributing the workload among the different nations. Technology Demonstrations hosted by the U.S. reps to Land Group, NATO Army Armaments Group (NAAG), will provide an opportunity to observe and demonstrate the current and future capability of participating NATO nations with a view to assisting future operational and materiel interoperability. Army will support of NAAG studies, analysis and technology demonstrations. Additional funds will be used to persue cooperative initiatives that were postponed, cancelled or not pursued due to funding reductions in previous years such as forums and engagement with long-standing foreign partners to identify interoperability gaps and develop necessary standardization programs.</p> <p>FY 2017 Plans: Senior National Representatives (Army) (SNR-(A)) Projects with international partner will support harmonization of programs at various levels: exchanging information, identifying knowledge gaps and conducting feasibility studies to further promote cooperative development; standardizing, fielding and road mapping various processes; distributing the workload among the different nations. Technology Demonstrations hosted by the U.S. reps to Land Group, NATO Army Armaments Group (NAAG), will provide an opportunity to observe and demonstrate the current and future capability of participating NATO nations with a view to assisting future operational and materiel interoperability. Army will support of NAAG studies, analysis and technology demonstrations. Additional funds will be used to persue cooperative initiatives that were postponed, cancelled or not pursued due to funding reductions in previous years such as forums and engagement with long-standing foreign partners to identify interoperability gaps and develop necessary standardization programs. FY17 funding will be used to pursue cooperative initiatives (i.e., forums and engagement with long-standing foreign partners to identify interoperability gaps and develop necessary standardization programs).</p> <p>FY 2018 Plans: Senior National Representatives (Army) (SNR-(A)) Projects with international partner will support harmonization of programs at various levels: exchanging information, identifying knowledge gaps and conducting feasibility studies to further promote cooperative development; standardizing, fielding and road mapping various processes; distributing the workload among the different nations. Technology Demonstrations hosted by the U.S. reps to Land Group, NATO Army Armaments Group (NAAG), will provide an opportunity to observe and demonstrate the current and future capability of participating NATO nations with a view to assisting future operational and materiel interoperability. Army will support of NAAG studies, analysis and technology demonstrations. Additional funds will be used to pursue cooperative initiatives that were postponed, cancelled or not pursued due to funding reductions in previous years such as forums and engagement with long-standing foreign partners to identify interoperability gaps and develop necessary standardization programs. FY18 funding will be used to pursue cooperative initiatives</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
(i.e., forums and engagement with long-standing foreign partners to identify interoperability gaps and develop necessary standardization programs).				
<p>Title: Weapons and Munitions Technologies</p> <p>Description: Weapons and munitions technologies (Partners: France, Germany, Italy, UK): The Participants in this program will develop an automated software interface between their national field artillery command and control systems. The nations will be able to receive and provide mutual fire support (i.e. cannon and rocket fire) in combined operations more rapidly and with minimal errors.</p> <p>FY 2016 Accomplishments: The goal of this activity is to cooperate with partner countries to increase interoperability and to develop jointly technologies to improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for Army weapons systems and associated munitions. Areas of cooperation include fuzing and warhead systems, guidance systems, counter improvised explosive device neutralization, directed energy, and fire control systems. Such cooperative development is done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries. Since FY15, efforts in this activity were combined with Artillery Command and Control Interoperability.</p> <p>FY 2017 Plans: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for Army weapons systems and associated munitions. Areas of cooperation include fuzing and warhead systems, guidance systems, counter improvised explosive device neutralization, directed energy, and fire control systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries. This activity was combined with Artillery Command and Control Interoperability in FY15. FY17 funding will be used to pursue cooperative projects (i.e., to develop and demonstrate interoperability among U.S. foreign partners artillery weapons systems and ammunitions).</p> <p>FY 2018 Plans: The goal of this project is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for Army weapons systems and associated munitions. Areas of cooperation include fuzing and warhead systems, guidance systems, counter improvised explosive device neutralization, directed energy, and fire control systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries. This program was combined with Artillery Command and Control</p>		1.238	0.100	0.113

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
Interoperability in FY15. FY17 funding will be used to pursue cooperative projects (i.e., to develop and demonstrate interoperability among U.S. foreign partners artillery weapons systems and ammunitions).				
<p>Title: Soldier Technologies</p> <p>Description: Soldier Technologies (Partners: United Kingdom, France, Germany, Italy, Sweden, Canada): Soldier Technologies will include R&D collaboration on technologies such as Counter Rocket and Mortar (C-RAM) and Counter Improvised Explosive Devices (C-IED). Programs include Military Operations in Urban Terrain (MOUT) and a variety of Defense Against Terrorism (DAT) initiatives such as Defense Against Mortar Attacks (DAMA) and Joint Precision Air Drop System (JPADS).</p> <p>FY 2016 Accomplishments: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly improved technologies to increase the effectiveness, health, and reliability of the individual soldier. Such technologies will maximize soldier survivability, sustainability, mobility, combat effectiveness, and field quality of life. Efforts under this project will also enable interoperability and standardization among partner country systems that support the individual soldier. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries. Since FY15 this program adopted Force Protection Project and projects under TRDP, additional funds will be used to pursue cooperative projects that were postponed or not pursue due to funding reductions in previous years such as cooperative projects in soldier psychological health and traumatic brain injury, improved small arms systems, eye safe lasers, portable soldier power technologies, and enhance body armor.</p>		0.288	-	-
<p>Title: Ground Systems Technologies</p> <p>Description: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve survivability, weapons, ground platforms (manned and unmanned), and mobility and counter-mobility to provide soldiers with unmatched offensive and defensive capabilities in weapons and military vehicles. Areas of cooperation include ground systems design, propulsion, structures, robotics, alternative fuels and lubricants, systems integration, electronics, and power management. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.</p> <p>FY 2016 Accomplishments: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve survivability, weapons, ground platforms (manned and unmanned), and mobility and counter-mobility to provide soldiers with unmatched offensive and defensive capabilities in weapons and military vehicles. Areas of cooperation will include ground systems design, propulsion, structures, robotics, alternative fuels and lubricants, systems integration, electronics, and power management. Such cooperative development will be done under the auspices of international agreements established among</p>		0.240	0.100	0.113

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries. Additional FY16 funds will be used to continue funding cooperative projects in armored vehicle underbody blast protection and unmanned ground vehicles such as Hybrid Electric PA between US and Japan.</p> <p>FY 2017 Plans: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve survivability, weapons, ground platforms (manned and unmanned), and mobility and counter-mobility to provide soldiers with unmatched offensive and defensive capabilities in weapons and military vehicles. Areas of cooperation will include ground systems design, propulsion, structures, robotics, alternative fuels and lubricants, systems integration, electronics, and power management. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries. FY17 funding will be used to fund the continuation of cooperative projects in armored vehicle underbody blast protection and unmanned ground vehicles such as Hybrid Electric Project Agreement between US and Japan.</p> <p>FY 2018 Plans: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve survivability, weapons, ground platforms (manned and unmanned), and mobility and counter-mobility to provide soldiers with unmatched offensive and defensive capabilities in weapons and military vehicles. Areas of cooperation will include ground systems design, propulsion, structures, robotics, alternative fuels and lubricants, systems integration, electronics, and power management. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries. FY17 funding will be used to fund the continuation of cooperative projects in armored vehicle underbody blast protection and unmanned ground vehicles such as Hybrid Electric Project Agreement between US and Japan.</p>				
<p>Title: Aviation Systems Technologies</p> <p>Description: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly improved aerodynamics, aeromechanics, avionics, weapons and sensor integration, propulsion, and aviation autonomy technologies that improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for vertical lift aviation systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.</p> <p>FY 2016 Accomplishments: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly improved aerodynamics, aeromechanics, avionics, weapons and sensor integration, propulsion, and aviation autonomy technologies that improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for vertical</p>		0.442	0.202	0.227

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>lift aviation systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries. Additional FY16 funds will be used to persue cooperative projects that were postponed or not pursued due to funding reductions in previous years such as cooperative projects to develop advance rotorcraft technologies and improve systems that aid pilots and aircrew in degraded visual environments.</p> <p>FY 2017 Plans: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly improved aerodynamics, aeromechanics, avionics, weapons and sensor integration, propulsion, and aviation autonomy technologies that improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for vertical lift aviation systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries. FY 17 funding will be used to pursue cooperative projects (i.e., the development of advance rotorcraft technologies and improve systems that aid pilots and aircrew in degraded visual environments).</p> <p>FY 2018 Plans: The goal of this activity is to cooperate with partner countries to increase interoperability and develop jointly improved aerodynamics, aeromechanics, avionics, weapons and sensor integration, propulsion, and aviation autonomy technologies that improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for vertical lift aviation systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries. FY 17 funding will be used to pursue cooperative projects (i.e., the development of advance rotorcraft technologies and improve systems that aid pilots and aircrew in degraded visual environments).</p>				
<p>Title: Chemical and Biological Defense Technologies</p> <p>Description: The goal of this project is to cooperate with partner countries to increase interoperability and standardization of chemical, biological, and radiological defense materiel and to develop jointly improved technologies to defend against weapons of mass destruction. Areas of cooperation include aerosol physics, toxicology, vaccinations, filtration science, agent detection and monitoring, handling, and demilitarization. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.</p> <p>FY 2016 Accomplishments: The goal of this project is to cooperate with partner countries to increase interoperability and standardization of chemical, biological, and radiological defense materiel and to develop jointly improved technologies to defend against weapons of mass</p>		0.240	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
destruction. Areas of cooperation include aerosol physics, toxicology, vaccinations, filtration science, agent detection and monitoring, handling, and demilitarization. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries. Additional FY16 funds will be used to continue cooperative projects that were postponed due to funds reductions in previous years, such as cooperative projects to develop vaccines for soldier protection against biological threats and enhanced radiological and biological threat detection systems.				
<p>Title: Missiles and Rocket Technologies</p> <p>Description: The goal of this project is to cooperate with partner countries to increase interoperability and develop jointly improved missile and rocket technologies, such as propulsion, energetic materials, payloads, flight control systems, sensors, and seekers. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purpose of improving defense capabilities of the U.S. and partner countries.</p> <p>FY 2016 Accomplishments: The goal of this project is to cooperate with partner countries to increase interoperability and develop jointly improved missile and rocket technologies, such as propulsion, energetic materials, payloads, flight control systems, sensors, and seekers. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purpose of improving defense capabilities of the U.S. and partner countries. a portion of former Technology Research and Development Projects (TRDP) was moved to Missiles and Rockets as part of project realignment in FY15. Additional FY16 funds are used to pursue cooperative projects that were postponed or not pursued due to funding reductions in previous years such as cooperative projects to enhance coalition capabilities in Ground-based Air Defense.</p>		0.192	-	-
Accomplishments/Planned Programs Subtotals		5.835	2.300	2.588
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
<p>Acquisition Strategy: The goal of this program is to expand worldwide allied standardization interoperability through cooperative research and development (R&D) and technology sharing per SECDEF guidance and especially in support of the of the U.S. Army. All projects are test or technical demonstrations to feed into potential new requirements in support of Army Transformation to the Future Force or as product improvements to the Current Force.</p>				

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / NATO Research and Development	Project (Number/Name) 691 / NATO Rsch & Devel
<p>List of the programs curenly in place:</p> <p>Communications, Interoperability, and Electronics Technologies The goal of this project is to develop technologies that enable interoperability among partner countries' command, control, communications, sensors, and information systems. Efforts under this project include development of a single solution standard avoiding development of multiple unique solutions and leverage existing interoperability standards developed by NATO. Such standards include common doctrine, technical and procedural specifications to make better use of existing information, shared data, leverage national operating picture capabilities and enable the development of interoperability of data, databases, applications, security domains and national networks architectures. Includes projects formerly titled Multi-National Network Enabled Capabilities, Low Level Air Defense Interoperability, JTRS, Combat Identification, and Multilateral Interoperability Program.</p> <p>Missile and Rocket Technologies The goal of this project is to cooperate with partner countries to increase interoperability and develop jointly improved missile and rocket technologies, such as propulsion, energetic materials, payloads, flight control systems, sensors, and seekers. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.</p> <p>Aviation Systems Technologies The goal of this project is to cooperate with partner countries to increase interoperability and develop jointly improved aerodynamics, aeromechanics, avionics, weapons and sensor integration, propulsion, and aviation autonomy technologies that improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for vertical lift aviation systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.</p> <p>Soldier Technologies The goal of this project is to cooperate with partner countries to increase interoperability and develop jointly improved technologies to increase the effectiveness, health, and reliability of the individual soldier. Such technologies will maximize soldier survivability, sustainability, mobility, combat effectiveness, and field quality of life. Efforts under this project will also enable interoperability and standardization among partner country systems that support the individual soldier. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.</p> <p>Chemical and Biological Defense Technologies The goal of this project is to cooperate with partner countries to increase interoperability and standardization of chemical, biological, and radiological defense materiel and to develop jointly improved technologies to defend against weapons of mass destruction. Areas of cooperation include aerosol physics, toxicology, vaccinations, filtration science, agent detection and monitoring, handling, and demilitarization. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.</p> <p>Ground Systems Technologies</p>		

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603790A / <i>NATO Research and Development</i>	Project (Number/Name) 691 / <i>NATO Rsch & Devel</i>
<p>The goal of this project is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve survivability, weapons, ground platforms (manned and unmanned), and mobility and counter-mobility to provide soldiers with unmatched offensive and defensive capabilities in weapons and military vehicles. Areas of cooperation include ground systems design, propulsion, structures, robotics, alternative fuels and lubricants, systems integration, electronics, and power management. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.</p> <p>Weapons and Munitions Technologies The goal of this project is to cooperate with partner countries to increase interoperability and develop jointly technologies to improve range, payloads, speed, survivability and lethality to maintain U.S. technical superiority and combat overmatch for Army weapons systems and associated munitions. Areas of cooperation include fuzing and warhead systems, guidance systems, counter improvised explosive device neutralization, directed energy, and fire control systems. Such cooperative development will be done under the auspices of international agreements established among the participating countries for the purposes of improving defense capabilities of the U.S. and partner countries.</p> <p>Senior National Representative (Army) program Senior National Representatives (Army) (SNR-(A)) Projects with international partners: Supports harmonization of programs at various levels: exchanging information, identifying knowledge gaps and conducting feasibility studies to further promote cooperative development; standardizing, fielding and road mapping various processes; distributing the workload among the different nations. Technology Demonstrations hosted by the U.S. reps to Land Group, NATO Army Armaments Group (NAAG), provides an opportunity to observe and demonstrate the current and future capability of participating NATO nations with a view to assisting future operational and materiel interoperability. Army support of NAAG studies, analysis and technology demonstrations.</p> <p>Armaments Cooperation Enterprise Support The goal of this program is to expand worldwide allied standardization and interoperability through cooperative research and development (R&D) and technology sharing per SECDEF guidance and especially in support of the U.S. Army. This program will fund the travel costs and administrative support (studies, analysis, interpretation, equipment, etc.) required to participate internationally, such as the North Atlantic Treaty Organization (NATO) Army Armaments Group (NAAG), Defense Against Terrorism (DAT) and to pursue new cooperative R&D initiatives and international cooperative agreements such as memoranda of understanding. This program will also include: the United States' share of costs of the NATO Civil Budget, Chapter IX, which funds the NATO Industrial Advisory Group (NIAG) and the Special Fund for Cooperative Planning (U. S. Army is Executive Agent for this NATO bill); the Technical Cooperation Program, and Army armaments cooperation working groups with many nations.</p> <p><u>E. Performance Metrics</u> N/A</p>		

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603801A / <i>Aviation - Adv Dev</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	10.014	14.055	-	14.055	10.909	21.942	55.007	187.511	Continuing	Continuing
B47: <i>Future Vertical Lift Medium</i>	-	0.000	10.014	14.055	-	14.055	10.909	21.942	55.007	187.511	Continuing	Continuing

Note

Future Vertical Lift (FVL), Project B47, is a 2017 New Start program with an approved Materiel Development Decision for a Capability Set 3 Aircraft October 2016.

A. Mission Description and Budget Item Justification

Future Vertical Lift (FVL) is an initiative to develop a family of vertical lift aircraft for the United States Armed Forces. FVL was established in 2009 by the Secretary of Defense to focus all Department of Defense (DoD) vertical lift capabilities and technology development, as well as retaining long-term engineering capabilities. In October 2011, the Deputy Secretary of Defense issued the FVL Strategic Plan to outline a joint approach for the next generation vertical lift aircraft for all military services. The Strategic Plan provided a foundation for replacing the current fleet with advanced capability by shaping the development of vertical lift aircraft for the next 25 to 40 years. The development and fielding of FVL will significantly improve vertical lift capabilities providing critical aviation support to the Joint warfighting community. Increases in range, speed, payload, survivability, reliability, and reduced logistical footprint can only be achieved through the FVL approach of developing a new aircraft design. FVL will integrate advancements in technologies and design configurations balanced with appropriate trades to ensure affordability.

PE 0603801A, Project B47, Future Vertical Lift funding provides for the development of a Capability Set 3 aircraft system within the FVL family of systems. FVL Capability Set 3 aircraft will conduct Air Assault, Amphibious Assault, Urban Assault/Security, Attack, Maritime Interdiction, Medical Evacuation (MEDEVAC), Humanitarian Assistance/Disaster Relief (HA/DR), Tactical Resupply, Direct Action (DA), Non-Combatant Evacuation Operation (NEO) and Combat Search and Rescue (CSAR) operations in support of Army, including Army Special Operations Command, Marine Corps and Joint forces. The FVL Capability Set 3 platform will significantly increase speed, range, mobility, and payload over current US Army H-60 and US Marine Corps H-1 aircraft and provide Combatant Commanders with tactical capabilities at greatly increased operational and strategic distances. The FVL Materiel Development Decision was approved in October 2016. FY 2017 funding provides for Analysis of Alternatives (AoA) Modeling, Simulation, and Analysis and Acquisition Strategy development. FY 2018 funding completes development and execution of the AoA, acquisition planning and strategy development, and begins development of the Technology Maturation and Risk Reduction (TMRR) Request for Proposal (RFP) and associated plans and other documentation required to support Milestone A decision and RFP release in FY 2019.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603801A / <i>Aviation - Adv Dev</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	10.014	9.008	-	9.008
Current President's Budget	0.000	10.014	14.055	-	14.055
Total Adjustments	0.000	0.000	5.047	-	5.047
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	5.047	-	5.047

Change Summary Explanation

FY18 Program Adjustment in the amount of \$5.047M funds FVL to current Program Office Estimate which was approved at MDD.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev				Project (Number/Name) B47 / Future Vertical Lift Medium			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
B47: Future Vertical Lift Medium	-	0.000	10.014	14.055	-	14.055	10.909	21.942	55.007	187.511	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Future Vertical Lift (FVL), Project B47, is a 2017 New Start program with an approved Materiel Development Decision for a Capability Set 3 Aircraft October 2016.

A. Mission Description and Budget Item Justification

Future Vertical Lift (FVL) is an initiative to develop a family of vertical lift aircraft for the United States Armed Forces. FVL was established in 2009 by the Secretary of Defense to focus all Department of Defense (DoD) vertical lift capabilities and technology development, as well as retaining long-term engineering capabilities. In October 2011, the Deputy Secretary of Defense issued the FVL Strategic Plan to outline a joint approach for the next generation vertical lift aircraft for all military services. The Strategic Plan provided a foundation for replacing the current fleet with advanced capability by shaping the development of vertical lift aircraft for the next 25 to 40 years. The development and fielding of FVL will significantly improve vertical lift capabilities providing critical aviation support to the Joint warfighting community. Increases in range, speed, payload, survivability, reliability, and reduced logistical footprint can only be achieved through the FVL approach of developing a new aircraft design. FVL will integrate advancements in technologies and design configurations balanced with appropriate trades to ensure affordability.

PE 0603801A, Project B47, Future Vertical Lift funding provides for the development of a Capability Set 3 aircraft system within the FVL family of systems. FVL Capability Set 3 aircraft will conduct Air Assault, Amphibious Assault, Urban Assault/Security, Attack, Maritime Interdiction, Medical Evacuation (MEDEVAC), Humanitarian Assistance/Disaster Relief (HA/DR), Tactical Resupply, Direct Action (DA), Non-Combatant Evacuation Operation (NEO) and Combat Search and Rescue (CSAR) operations in support of Army, including Army Special Operations Command, Marine Corps and Joint forces. The FVL Capability Set 3 platform will significantly increase speed, range, mobility, and payload over current US Army H-60 and US Marine Corps H-1 aircraft and provide Combatant Commanders with tactical capabilities at greatly increased operational and strategic distances. The FVL Materiel Development Decision was approved in October 2016. FY 2017 funding provides for Analysis of Alternatives (AoA) Modeling, Simulation, and Analysis and Acquisition Strategy development. FY 2018 funding completes development and execution of the AoA, acquisition planning and strategy development, and begins development of the Technology Maturation and Risk Reduction (TMRR) Request for Proposal (RFP) and associated plans and other documentation required to support Milestone A decision and RFP release in FY 2019.

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

	FY 2016	FY 2017	FY 2018
Title: Future Vertical Lift (FVL) Analysis of Alternatives	-	4.336	3.107
Description: FVL AoA modeling, simulation, and analysis performed by U.S. Army TRADOC Analysis Center, U.S. Army Materiel Systems Analysis Activity and other supporting agencies.			
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift Medium

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
AoA and Modeling, Simulation, and Analysis, Systems Engineering and Program Management, travel, contractor support, and Program Management administrative cost. FY 2018 Plans: Complete AoA report documentation and staffing. Note: FY17 allocation between AoA and Program Management activities has changed due to maturation of AoA execution plan.			
Title: Engineering Services / Research Studies Description: Engineering research, planning, modeling, analyses and reviews supporting the FVL acquisition program. FY 2017 Plans: Provide technical/engineering support for AoA modeling, simulation, and analysis. Develop FVL systems engineering and product support plans. Begin development of Technology Readiness Assessments of materiel solution concepts. FY 2018 Plans: Continue to support FVL AoA modeling, simulation and analysis. Complete Systems Engineering Plan, Initial Technology Readiness Assessments, Core Logistics Assessment and Initial Test & Evaluation Master Plan. Support development of FVL TMRR RFP, Capability Development Document and Milestone A documentation.	-	3.386	8.401
Title: Program Management Description: Oversight and management of FVL acquisition program. FY 2017 Plans: blank FY 2018 Plans: Complete acquisition planning and strategy development for FVL Capability Set 3 aircraft. Begin development of TMRR RFP, Source Selection Plan and related documents. Conduct Milestone A planning, documentation, and reviews. Note: FY17 allocation between AoA and Program Management activities has changed due to maturation of AoA execution plan.	-	2.292	2.547
Accomplishments/Planned Programs Subtotals	-	10.014	14.055

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 0603003A: Aviation Advanced Technology	99.542	94.280	160.746	-	160.746	127.723	109.378	110.247	112.356	0.000	814.272

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift Medium
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks
PE 0603003A / Aviation Advanced Technology funds the Joint Multi-Role (JMR) Technology Demonstrator (TD) and other Army Science & Technology (S&T) projects to mature and demonstrate manned and unmanned air vehicle technologies to enable Army aviation modernization and reduce risk for FVL. JMR TD is not an FVL prototyping effort nor indicative of an end state FVL performance requirement.

D. Acquisition Strategy

An Analysis of Alternatives (AoA) will be initiated in 3rd Quarter FY 2017 to assess the technical feasibility, operational feasibility, technical risk, and affordability of potential materiel solutions. The AoA will be informed by previous studies, ongoing Advanced Technology Development S&T projects, and input from Government, Industry and Academia. The results of the AoA and Technology Readiness Assessments will be used to support a Milestone A Decision in 2nd Quarter FY 2019 and a Technology Maturation and Risk Reduction (TMRR) RFP Release in 3rd Quarter FY 2019. After a successful Milestone A Decision, the Army will award competitive TMRR contracts to complete preliminary design and risk reduction testing. At the end of TMRR, and after a successful Milestone B Decision, the Army will award an Engineering and Manufacturing Development (EMD) contract to complete development and testing of the most cost effective system before entering the Production and Deployment phase in the FY 2029 timeframe.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift Medium
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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	FVL Program Office : Redstone Arsenal, AL	0.000	-		2.292	May 2017	2.547	Oct 2017	-		2.547	Continuing	Continuing	0.000
Subtotal			0.000	-		2.292		2.547		-		2.547	-	-	0.000

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Analysis of Alternatives (AoA)	TBD	TRADOC Analysis Center : Fort Leavenworth, KS	0.000	-		4.336	May 2017	3.107	Nov 2017	-		3.107	0.000	7.443	0.000
Subtotal			0.000	-		4.336		3.107		-		3.107	0.000	7.443	0.000

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering Services / Research Studies - Organic	MIPR	FVL Program Office : Redstone Arsenal AL	0.000	-		1.700	May 2017	5.485	Apr 2018	-		5.485	0.000	7.185	Continuing
Engineering Services / Research Studies - Other	C/FFP	GSA : Atlanta, GA	0.000	-		1.686	Aug 2017	2.916	Dec 2017	-		2.916	0.000	4.602	Continuing
Subtotal			0.000	-		3.386		8.401		-		8.401	0.000	11.787	-

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		0.000	-	10.014	-	14.055	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift Medium
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022							
	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) Materiel Development Decision					▲ MDD																											
Analysis of Alternatives																																
Preparation of Milestone A Documentation and Review																																
(2) Milestone A																																
(3) Request for Proposal Release																																
Proposal Preparation																																
Source Selection Evaluation Board																																
Technology Maturation and Risk Reduction Contract																																

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603801A / Aviation - Adv Dev	Project (Number/Name) B47 / Future Vertical Lift Medium
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Matériel Development Decision	1	2017	1	2017
Analysis of Alternatives	3	2017	4	2018
Preparation of Milestone A Documentation and Review	3	2018	2	2019
Milestone A	2	2019	2	2019
Request for Proposal Release	3	2019	3	2019
Proposal Preparation	3	2019	1	2020
Source Selection Evaluation Board	2	2020	4	2020
Technology Maturation and Risk Reduction Contract	2	2021	1	2024

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	20.271	20.834	35.333	-	35.333	18.397	18.177	17.392	17.136	Continuing	Continuing
526: Marine Orien Log Eq Ad	-	2.445	3.976	4.345	-	4.345	3.938	3.962	3.969	3.960	Continuing	Continuing
EW8: Armored Engineer Vehicles	-	0.000	0.000	12.200	-	12.200	0.000	0.000	0.000	0.000	Continuing	Continuing
G11: Adv Elec Energy Con Ad	-	8.525	6.166	6.524	-	6.524	8.183	8.338	7.822	8.040	Continuing	Continuing
G14: Materials Handling Equipment - Ad	-	0.137	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
K39: Field Sustainment Support Ad	-	1.800	2.629	2.429	-	2.429	2.507	1.868	1.917	1.975	Continuing	Continuing
K41: Water And Petroleum Distribution - Ad	-	3.615	3.662	4.773	-	4.773	0.000	0.000	0.000	0.000	Continuing	Continuing
VR8: Combat Service Support Systems - Ad	-	3.749	4.401	5.062	-	5.062	3.769	4.009	3.684	3.161	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element supports advanced component development and prototypes of new and improved technologies for combat support and combat service support equipment essential to sustaining combat operations. Advancements in bridging, electric power generators, material-handling, environmental control, shelter systems, cargo aerial delivery, field service systems, mortuary affairs equipment and petroleum equipment are necessary to improve safety and increase the tactical mobility, operational capability, lethality and survivability on the digital battlefield and to provide for greater sustainment while reducing the logistics support burden. Army Watercraft funding supports initiatives to enhance the seaworthiness, safety, survivability, supportability, energy efficiency, environmental, regulatory compliance and reliability of existing systems.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	21.233	20.834	19.492	-	19.492
Current President's Budget	20.271	20.834	35.333	-	35.333
Total Adjustments	-0.962	0.000	15.841	-	15.841
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.139	-			
• SBIR/STTR Transfer	-0.823	-			
• Adjustments to Budget Years	0.000	0.000	15.841	-	15.841

Change Summary Explanation

FY18 Added Armored Engineer Vehicles project EW8.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev				Project (Number/Name) 526 / Marine Orien Log Eq Ad			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
526: Marine Orien Log Eq Ad	-	2.445	3.976	4.345	-	4.345	3.938	3.962	3.969	3.960	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program element supports projects and studies for advanced component development, including prototypes of equipment and sub-systems which provide critical capabilities for Unified Land Operations (ULO), by extending the Commander's available maneuver space into and throughout the littorals, inland waterways and near coastal regions. Army watercraft equipment enables the conduct of riverine, Logistics-over-the-Shore (LOTS) and Joint Logistics-over-the-Shore (JLOTS), inter and intra-theater transport, movement and maneuver, mission command and sustainment, as identified in DODD 5100.01 (Functions of the Department of Defense and it's major components). Army Watercraft exploit the inland waterways and littoral regions as waterborne maneuver and supply routes, conducting operations through littoral entry points (developed, undeveloped, and austere access points) and in non-permissive, and/or denied access scenarios. The Army uses a spectrum of Army Watercraft systems, from heavy sustainment ocean going landing craft capable of intra-theater and ship to shore transport and undeveloped beach or harbor access, to oceangoing and harbor utility tug boats and barge derricks for transport and denied port/salvage operations, and modular causeway systems for (LOTS/JLOTS). The funding supports initiatives to enhance the seaworthiness, safety, survivability, supportability, energy efficiency, environmental, regulatory compliance and reliability of existing systems. Funded efforts will address critical gaps in these areas for the current fleet, while at the same time researching, developing and testing emergent technologies in a manner to support future acquisitions and future fleet planning. The funding enables our compliance with the National Defense Authorization Act of 1996 and 502(6) of the Clean Water Act and compliance with Environmental protection Agency (EPA) emission standards.

FY18 funding will primarily support maturation of the Service Life Extension Program (SLEP) design for the Modular Warping Tug (MWT), support continued integration of Force Protection, and environmental projects.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Army Watercraft Program Support	0.475	0.574	0.370	-	0.370
Description: PM/Matrix Salary Support includes Program Management and System Engineering resources required to manage the program projects and provide contractor oversight. It also includes benefits, travel, personnel training and other Government costs required to retain a professional acquisition workforce.					
FY 2016 Accomplishments: -Developed a Flexor study for the Modular Causeway System (MCS) resulting in contract award. -Funded salary support to the Navy for Uniform National Discharge Standards (UNDS) analysis and committee representation.					
FY 2017 Plans:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) 526 / <i>Marine Oriented Log Eq Ad</i>			
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
PM/Matrix Support includes PM and System Engineering oversight required to manage the program and provide contractor oversight. Salaries, benefits, travel, personnel training and other Government costs are included for retaining a profession acquisition workforce. FY 2018 Base Plans: -PM/Matrix Support. -Fund Navy for UNDS analysis and committee representation.					
Title: Force Protection Capability Description: Army Watercraft Systems (AWS) Force Protection capability is limited to defensive measures. Current efforts include development of gunner station and weapon station locations, integration of Common Remotely Operated Weapon Station (CROWS) and non-lethal Escalation of Force (EoF). The EoF capability includes white light, green dazzler, an acoustic device, and percussion grenades. FY 2016 Accomplishments: Funded concept development for integration of CROWS on Logistics Support Vessel (LSV) 7-8 Class vessels. FY 2017 Plans: Continue Force Protection, lethal (CROWS) and non-lethal (EoF) suite includes white light, eye safe laser, acoustic device and percussion grenades for LSV fleet. FY 2018 Base Plans: -Develop CROWS Integration kit for LCU 2000. -Continue EoF development.	0.140	0.500	0.770	-	0.770
Title: At Sea Transfer Technology Description: At Sea Transfer Technology enables roll on and roll off (RO/RO) capability from vessels at sea; and causeway transport of vehicles and equipment to the beach or shore. The current effort serves to inform development of a Service Life Extension Program (SLEP) for the Modular Warping Tug (MWT) and Causeway Ferry (CF) which are principle working platforms in the Modular Causeway System (MCS). FY 2016 Accomplishments: -MWT/CF Electrical Design Study - 75% complete. -Developed Technical Data Package (TDP) for 1 of 9 MWT/CF modules.	0.541	1.175	2.150	-	2.150

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) 526 / <i>Marine Oriented Log Eq Ad</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
-Awarded Flexor Study. FY 2017 Plans: At Sea Transfer Development to include Modular Warping Tug (MWT) Standardization Project (ESTDSP) Study including Monthly Status Report, In Progress Reviews, Assessment of Solutions Report, and a Land Based Test site with drawings for the Solution. FY 2018 Base Plans: -Continue to develop the MWT/CF SLEP Design Solution; transition design to prototype. -Continue development of the MWT/CF Technical Data Package (TDP).					
Title: Environmental Compliance Projects Description: Environmental projects enable compliance with requirements as defined in law under Uniform National Discharge Standards (UNDS) and Environmental Protection Agency (EPA) emissions standards. The EPA reviews the UNDS Code of Federal Regulations (CFR) language in five year increments separated into three batches (types of discharge). This is an ongoing assessment of statutory language which may or may not result in material solution change. FY 2016 Accomplishments: - Completed feasibility study for the Marine Sanitation Device (MSD) Mobile Test Facility. - Continuation of Oily Water Separator (OWS) comparative analysis initiated in FY15. - Completed operational requirements draft for clean ballast water study. FY 2017 Plans: Funding to continue identification of Environmental Compliance Technologies IAW evolving statutory and regulatory requirements. Support from Navy UNDS experts. FY 2018 Base Plans: - Funding to continue identification of Environmental Compliance Technologies IAW evolving statutory and regulatory requirements. - Continue MSD shipboard test and evaluation. - Continue OWS requirement and capability analysis. - Continue Clean Ballast Water requirement and capability analysis.	1.126	1.127	1.055	-	1.055
Title: Army Watercraft Module Support System (AWMSS) formerly (AWMB)	0.063	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) 526 / <i>Marine Orient Log Eq Ad</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Description: Accommodations for supercargo to support the soldier at sea.					
FY 2016 Accomplishments: AWMSS prototype completion and safety improvements.					
Title: Energy Efficiency and Emissions Compliance	0.100	0.600	-	-	-
Description: Energy efficiency and emission compliance of Army Watercraft explores emerging technologies to improve power consumption, conform with regulation, and reduce the environmental impact of Army Watercraft.					
FY 2016 Accomplishments: Completed the Preliminary Design Review (PDR) for the electrical redesign of the MWT that included batteries as well as the entire electrical system. This informs the MWT SLEP and meets energy standards.					
FY 2017 Plans: Energy Efficiency and Emissions Compliance: Electrical System Technology Development and Standardization Project (ESTDSP) Study Plan, Monthly Status Report, a Monthly In Progress Reviews, Reports and Other AAS Documentation.					
Accomplishments/Planned Programs Subtotals	2.445	3.976	4.345	-	4.345

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• MA4501000 MODIFICATION KITS: MA4501000 MODIFICATION KITS	3.912	6.276	7.018	-	7.018	7.864	8.343	8.463	8.874	Continuing	Continuing
• MA4502000 INSTALLATION OF MODS: MA4502000 INSTALLATION OF MODIFICATIONS	5.393	7.006	3.263	-	3.263	3.246	3.839	3.914	4.020	Continuing	Continuing
• M11101000 Army Watercraft Esp: M11101000 Army Watercraft Esp	39.772	21.860	20.110	-	20.110	41.465	42.237	63.130	43.630	Continuing	Continuing
• ML5355 ITEMS LESS THAN \$5.0M: ML5355 ITEMS LESS THAN \$5.0M (FLOAT RAIL)	5.835	1.967	2.877	-	2.877	2.927	2.974	2.487	2.510	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) 526 / <i>Marine Oriented Log Eq Ad</i>

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

FY16 Significant Achievements:
 -Flexor Study awarded July 16
 -AWMSS - Safety updates complete
 -Completed 75% of MWT electrical redesign and developed TDP for 1 of 9 MWT modules

D. Acquisition Strategy

Leverage government and public research centers (TARDEC and Naval Surface Warfare Center (NSWC) Philadelphia) and known public research institutes (Battelle) along with associated contract mechanisms to prototype, test, and evaluate component technologies that may be applicable to the current and future Army Watercraft fleet.

E. Performance Metrics

-Integrated Master Schedule (IMS) whereby cost, schedule, and performance including critical path can be measured.
 -Technical Reviews with entrance and exit criteria.
 -Deliverables:
 • drawings
 • test data and test reports
 • studies and analytical reports
 • final project reports

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>				Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EW8: <i>Armored Engineer Vehicles</i>	-	0.000	0.000	12.200	-	12.200	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
The Joint Assault Bridge (JAB) was funded under PR 654804/H02 in FY17 and prior.

A. Mission Description and Budget Item Justification

This project supports live fire test and evaluation, initial operational test and evaluation and production qualification testing of the Joint Assault Bridge (JAB). This project also funds efforts to upgrade and modernize the Assault Bridging Management portfolio through the development of new systems and enhancement of existing systems such as the M9 Armored Combat Earthmover (ACE) replacement.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Joint Assault Bridge Testing	-	-	12.200	-	12.200
FY 2018 Base Plans: Funding supports live fire test and evaluation, initial operational test and evaluation and production qualification testing of the Joint Assault Bridge (JAB).					
Accomplishments/Planned Programs Subtotals	-	-	12.200	-	12.200

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• WTCV, GZ3001: <i>Joint Assault Bridge</i>	33.455	64.752	128.350	-	128.350	165.936	207.660	212.783	263.068	Continuing	Continuing

Remarks

D. Acquisition Strategy

RDT&E efforts to support testing and follow-on production for Assault Bridging.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>
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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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 Support	MIPR	Various : Various	0.000	-		-		0.600	Nov 2017	-		0.600	0.000	0.600	0.000
Subtotal			0.000	-		-		0.600		-		0.600	0.000	0.600	0.000

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Initial Operational Test & Evaluation (IOTE)	MIPR	Operational Test Command : Ft. Hood, TX	0.000	-		-		6.693	Mar 2018	-		6.693	0.000	6.693	0.000
Developmental Testing & Operational Testing (DT / OT)	MIPR	Aberdeen Proving Grounds : MD	0.000	-		-		0.407	Nov 2017	-		0.407	0.000	0.407	0.000
Production Qualification Testing (PQT)	MIPR	Aberdeen Proving Grounds : MD	0.000	-		-		4.500	Nov 2017	-		4.500	0.000	4.500	0.000
Subtotal			0.000	-		-		11.600		-		11.600	0.000	11.600	0.000

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		0.000	-	0.000	12.200	-	12.200	0.000	12.200	0.000

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Joint Assault Bridge Development & Testing																												
Life Fire Test & Eval Armor Development																												
(1) Milestone "C"					LFT&E Armor Development																							
(2) Low Rate Initial Production					▲ MS"C"																							
(3) Critical Design Review					▲ LRIP																							
Life Fire Test & Eval					▲ CDR																							
Production Qualification Test									LFT&E																			
Developmental Test / Operational Test									■ PQT																			
Initial Operational Test & Eval									■ DT/OT																			
(4) Full Rate Production									■ IOT&E																▲ FRP			

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) EW8 / <i>Armored Engineer Vehicles</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Joint Assault Bridge Development & Testing	1	2016	1	2019
Life Fire Test & Eval Armor Development	1	2016	4	2016
Milestone "C"	3	2016	3	2016
Low Rate Initial Production	3	2016	3	2016
Critical Design Review	4	2016	4	2016
Life Fire Test & Eval	4	2016	4	2018
Production Qualification Test	4	2017	2	2018
Developmental Test / Operational Test	2	2018	2	2018
Initial Operational Test & Eval	3	2018	3	2018
Full Rate Production	1	2019	1	2019

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>				Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
G11: <i>Adv Elec Energy Con Ad</i>	-	8.525	6.166	6.524	-	6.524	8.183	8.338	7.822	8.040	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Management and Distribution Control (MDC) was previously named Improved Power Distribution Illumination Systems Electrical (IPDISE).

A. Mission Description and Budget Item Justification

The Tactical Electric Power (TEP) program was established by the Department of Defense to develop modernized, standard families of mobile electric power sources and power distribution systems for all Services throughout the Department of Defense. Project Manager Expeditionary Energy & Sustainment Systems (PM E2S2) derives concept and technology developments that will improve the performance, mobility, readiness and survivability of the next generation of tactical power sources in support of all Services. It supports initiatives that are essential to the development and fielding of modernized TEP sources from Watts to Megawatts level that comply with environmental statues and provide noise and signature-suppressed, energy-efficient, lightweight, deployable and reliable equipment. FY18 funding will support test and evaluation of technologies for Small Tactical Electric Power (STEP), Platoon Power Generation (PPG), Mobile Electric Hybrid Power Sources (MEHPS), and Management and Distribution Control (MDC). Also, funding will support a holistic Modeling and Simulation approach to the evaluation of Operational Energy (OE)-related impacts, systems, and improvements; with the vision of reducing Army energy dependency and demand, increasing systems and contingency bases energy efficiency, seeking alternative energy sources and supporting a culture of energy responsibility while sustaining or enhancing operational capabilities. This includes support of the Joint Operational Energy Initiative (JOEI). Out years will support investigation of general advancements in engine, power equipment, energy storage, renewable/alternative energy, and power distribution equipment that are applicable to current equipment and emerging requirements. In addition, an extensive analysis of commercial generator technology is planned to support requirements definition for the next family of tactical sets. Programs include costs for developing concept hardware and executing system evaluations at the Network Integration Evaluation (NIE) events at Ft. Bliss.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Contract Activity	4.525	3.066	3.524	-	3.524
Description: Continue development of technology supporting the STEP program, MDC, and MEHPS.					
FY 2016 Accomplishments: Developed various technologies related to TEP and power distribution/management across the DoD power spectrum. Specific efforts included STEP components, PPG prototypes, MEHPS components and MDC. Developed tools, systems and capability to provide holistic Modeling and Simulation (M&S) analysis of Operational Energy impacts, systems and potential improvements.					
FY 2017 Plans:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Develop various technologies related to TEP and power distribution/management across the DoD power spectrum. Specific efforts will include demo of metering and monitoring systems, energy storage and inverter systems, and MDC. Develop tools, systems and capability to provide holistic M&S analysis of Operational Energy impacts, systems and improvements.</p> <p>FY 2018 Base Plans: Develop various technologies related to TEP and power distribution/management across the DoD power spectrum. Specific efforts will include demo of metering and monitoring systems, energy storage and inverter systems, and MDC. Develop tools, systems and capability to provide holistic M&S analysis of Operational Energy, and support customer/stakeholder analysis to inform key Science and Technology (S&T), Acquisition, and Requirements Development decision making.</p>					
<p>Title: Government System Test and Evaluation</p> <p>Description: Supports in house and external performance tests of concept hardware. Also supports evaluation of systems at Network Integration Evaluation (NIE).</p> <p>FY 2016 Accomplishments: Evaluated and tested various technologies related to tactical electric power and power distribution and management across the DoD power spectrum. Efforts were aimed at resolving technology gaps to meet Army User requirements. Specific efforts included fabrication and performance testing of small generator sets, integration of generators with hybrid/alternative energy power sources, and intelligent power distribution/management systems. Program also supported Type Classification efforts for improved Command Post infrastructure. Program supported new equipment and concept demonstrations at NIE 16.2.</p> <p>FY 2017 Plans: Continue evaluation and testing of various technologies related to tactical electric power and power distribution and management across the DoD power spectrum. Efforts will be aimed at resolving technology gaps to meet Army User requirements. Efforts will support the TEP Capabilities Production Document (CPD). Specific efforts will include performance testing of hybrid/alternative energy power sources, open standards grid communications, small power sources, and intelligent power distribution/management systems. Program supports new equipment and concept demonstrations at NIE 17.2.</p> <p>FY 2018 Base Plans: Continue evaluation and testing of various technologies related to tactical electric power and power distribution and management across the DoD power spectrum. Efforts will be aimed at resolving technology gaps to meet</p>	1.500	0.400	0.400	-	0.400

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Army User requirements. Efforts will support the TEP CPD. Specific efforts will include performance testing of hybrid/alternative energy power sources, open standards grid communications, and intelligent power distribution/management systems. Program supports new equipment and concept demonstrations at NIE 18.2.					
Title: Other Contracts and Government agencies Description: Matrix engineering and analysis support for continued development of technology supporting the STEP program, MDC, and MEHP, as well as analysis and data management. FY 2016 Accomplishments: Prepared analysis of various technologies related to tactical electric power and power distribution and management across the DoD power spectrum. Specific efforts included performance testing of small generator sets, hybrid/alternative energy power sources, and intelligent power distribution/management systems. Program also supported Type Classification efforts for improved Command Post infrastructure. Program supported new equipment and concept demonstrations at NIE 16.2. FY 2017 Plans: Continue evaluation and testing of various technologies related to tactical electric power and power distribution and management across the DoD power spectrum. Efforts will be aimed at resolving technology gaps to meet Army User requirements. Efforts will support the TEP CPD. Specific efforts will include contract management and testing of small generator sets, hybrid/alternative energy power sources, and power distribution/management systems. Program supports new equipment and concept demonstrations at NIE 17.2. Includes oversight, analysis and management of Operational Energy-related impacts, systems and improvements to reduce Army's energy dependence and improve operational capabilities. FY 2018 Base Plans: Continue evaluation and testing of various technologies related to tactical electric power and power distribution and management across the DoD power spectrum. Efforts will be aimed at resolving technology gaps to meet Army User requirements. Efforts will support the TEP CPD. Specific efforts will include contract management and testing of hybrid/ alternative energy power sources and power distribution/management systems. Program supports new equipment and concept demonstrations at NIE 17.2. Includes oversight, analysis and management of Operational Energy-related impacts, systems and improvements to reduce Army's energy dependence and improve operational capabilities.	1.000	1.400	1.300	-	1.300
Title: Government Program Management	1.500	1.300	1.300	-	1.300

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Description: Continue development of technology supporting the STEP program, MDC and MEHPS.</p> <p>FY 2016 Accomplishments: Provided oversight and management of various technology projects related to Tactical Electric Power and power distribution/management across the DoD power spectrum. Efforts were aimed at resolving technology gaps to meet Army User requirements. Efforts supported the STEP and PPG programs and the TEP Capabilities Production Document (CPD). Specific efforts included development of small sets, MEHPS and intelligent power systems. Provided oversight, analysis and management of Operational Energy-related impacts, systems and improvements to reduce Army's energy dependence and improved operational capabilities. Supported Type Classification of AMMPS microgrid and power distribution components.</p> <p>FY 2017 Plans: Oversight and management of various technology projects related to Tactical Electric Power and power distribution/management across the DoD power spectrum. Efforts will be aimed at resolving technology gaps to meet Army User requirements. Efforts will support the TEP CPD. Specific efforts will include support of MEHPS, STEP, and power MDC systems. Oversight, analysis and management of Operational Energy-related impacts, systems and improvements to reduce Army's energy dependence and improve operational capabilities.</p> <p>FY 2018 Base Plans: Oversight and management of various technology projects related to Tactical Electric Power and power distribution/management across the DoD power spectrum. Efforts will be aimed at resolving technology gaps to meet Army User requirements. Efforts will support the TEP Capabilities Production Document (CPD). Specific efforts will include support of MEHPS, and power MDC systems. Oversight, analysis and management of Operational Energy-related impacts, systems and improvements to reduce Army's energy dependence and improve operational capabilities.</p>					
Accomplishments/Planned Programs Subtotals	8.525	6.166	6.524	-	6.524

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 654804.194: <i>Logistics and Engineer Equipment - Eng Dev 194</i>	5.257	13.676	12.890	-	12.890	14.689	8.099	2.588	8.449	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) G11 / <i>Adv Elec Energy Con Ad</i>

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2018</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• MA9800: <i>OPA 3, Generators and Associated Eq. MA9800</i>	97.154	145.027	115.635	0.569	116.204	128.610	127.262	127.148	130.781	Continuing	Continuing

Remarks

D. Acquisition Strategy

Complete advanced development pre-milestone B technology assessments and analysis, and transition products to Engineering and Manufacturing Development (EMD) phase (Milestone B) and subsequent transition to production (Milestone C). Support concept development and demonstration efforts. Products and technologies supported include tactical power and energy sources, alternative/renewable energy systems, power distribution components, and power management and distribution control systems. Provide analysis of Operational Energy related impacts to future development programs across RDECOM.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>				Project (Number/Name) G14 / <i>Materials Handling Equipment - Ad</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
G14: <i>Materials Handling Equipment - Ad</i>	-	0.137	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports component development and Material Handling Equipment (MHE) prototyping and stays abreast of emerging and available technologies to be integrated into military MHE to address identified capability gaps and warfighter objectives. This project enables the development of selected technologies and transition to system integration and development or production of MHE products. MHE includes 5K Light Capability Rough Terrain Forklifts (LCRTF), Rough Terrain Container Handlers (RTCH) and Cranes, as well as ancillary MHE equipment, to support distribution of critical supplies in the theater of operations.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: System Engineering/Program Management Support	0.137	-	-	-	-
Description: Research and integrate technologies to enhance operations of Material Handling Equipment.					
FY 2016 Accomplishments: Researched and integrated technologies to enhance operations of Material Handling Equipment.					
Accomplishments/Planned Programs Subtotals	0.137	-	-	-	-

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 5K LCRTF G41002: 5K <i>Light Capacity Rough Terrain (LCRT) Forklift G41002</i>	27.982	3.153	9.000	-	9.000	17.937	18.297	19.721	20.345	Continuing	Continuing

Remarks

D. Acquisition Strategy

Procure prototype component items for engineering tests and demonstrations with subject matter experts. Conduct trades between cost and improved maintainability and environmental risk reduction. Process engineering change proposals, update technical manuals and training materials, and prepare supporting acquisition documents and data to procure new training aids. Develop additional capabilities for existing systems such as the 5K Light Capability Rough Terrain Forklifts, Rough Terrain Container Handler, and All Terrain Lifting Army System which will allow for improved safety, autonomous or semi autonomous operation. Award contracts with

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army Date: May 2017

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
2040 / 4	PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	G14 / <i>Materials Handling Equipment - Ad</i>

vehicle or Autonomus System Developer/TARDEC Robotics to integrate existing technologies onto the platforms to allow for ease of operation or removal of the operator from vehicle. Testing will be conducted at Aberdeen Proving Grounds, MD.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>				Project (Number/Name) K39 / <i>Field Sustainment Support Ad</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
K39: <i>Field Sustainment Support Ad</i>	-	1.800	2.629	2.429	-	2.429	2.507	1.868	1.917	1.975	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports development of critical soldier support and sustainment systems for cargo aerial delivery capabilities. These systems will fill identified theater distribution and services capability gaps, improve unit sustainability, and increase combat effectiveness. This project supports Advanced Component Development and Prototyping of Critical Distribution Capabilities which provide improved safety and accuracy while increasing survivability of aircraft, personnel, and equipment. This project develops critical enablers that support the Quartermaster (QM) Force Transformation Strategy and The Army's Modular Capabilities by maintaining readiness through fielding and integrating new equipment. This project also ensures Army Expeditionary Forces are capable of rapid deployment through aerial delivery initiatives and reduces sustainment requirements, related Combat Support/Combat Service Support (CS/CSS) demands in lift, combat zone footprint, and costs for logistical support.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Extracted High and Low Speed Container Delivery System (EHLSCDS)	1.800	-	-	-	-
Description: Provides a high speed (230 knot), low altitude (375 ft AGL) capability for up to eight Container Delivery Systems (CDS) to enhance aircraft and aircrew survivability and safety while improving accuracy and reducing dispersion for receiving ground units.					
FY 2016 Accomplishments: Completed EHLSCDS Design Validation (DV) testing, completed Milestone B and transitioned program into Engineering and Manufacturing Development (EMD).					
Title: Sustainment Aerial Delivery Equipment Helicopter Attachment Unassisted Load-Hook Up (SADE HAUL-UP)	-	1.229	-	-	-
Description: Provides a safe hookup of cargo loads transported under helicopters for resupply and transportation purposes. SADE HAUL-UP will eliminate the requirement for personnel to be positioned between the hovering helicopter and the load in dynamic operational conditions in order to physically attach the load, enhancing safety of the sling load operation.					
FY 2017 Plans:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) K39 / <i>Field Sustainment Support Ad</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Conduct advanced component prototype design & fabrication on SADE Autoload Hookup with focus on reducing technology, engineering, integration, and life-cycle cost risk. Begin technology development demonstrations on prototype systems.					
<p>Title: Joint Precision Airdrop System-2K Block 1 Upgrade (JPADS-BLK1)</p> <p>Description: Supports increasing the technological and design maturity, testing, and integration of several key initiatives focused on: maintaining system accuracy and reliability in Global Positioning System (GPS) denied environments; collision avoidance; more precise position determination software; and improved Guidance Navigation and Control (GN&C) hardware.</p> <p>FY 2017 Plans: Conduct advanced component prototype design & fabrication on JPADS-2K Block 1 upgrade solutions with focus on reducing technology, engineering, integration, and life-cycle cost risk. Conduct technology development demonstrations to determine if identified JPADS-2K Block 1 upgrade solutions are feasible, affordable, and supportable; satisfy validated capability requirements; and have acceptable technical risk.</p>	-	1.400	-	-	-
<p>Title: Rapid Rigging and DeRigging Airdrop System (RRDAS)</p> <p>Description: Reduces rigging times while also providing the capability to rapidly de-rig loads on the drop zone. This will reduce the lead time to prepare LVADS loads while also increasing the survivability of receiving ground forces by ensuring the airdrop loads (to include weapon systems, prime movers, trailers, etc.) are quickly de-rigged and made operational.</p> <p>FY 2018 Base Plans: Conduct market research with a focus on acquiring advanced component prototype designs with a goal of reducing technology, engineering, integration and life cycle risk. Begin technology development demonstration on prototype systems.</p>	-	-	1.750	-	1.750
<p>Title: Advanced Low Velocity Airdrop System (ALVADS) - Light and Heavy/ Dual Row Airdrop System (DRAS) Application</p> <p>FY 2018 Base Plans: Conduct DRAS developmental prototype testing to establish ALVADS DRAS configuration.</p>	-	-	0.679	-	0.679
Accomplishments/Planned Programs Subtotals	1.800	2.629	2.429	-	2.429

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) K39 / <i>Field Sustainment Support Ad</i>

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

Line Item	FY 2016	FY 2017	FY 2018	FY 2018	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Cost To	
			Base	OCO	Total					Complete	Total Cost
• OPA MA7806: <i>Precision Airdrop MA7806</i>	3.291	4.298	4.147	-	4.147	2.178	2.219	2.282	2.348	Continuing	Continuing
• RDT&E 654804.L39: <i>Field Sustainment Support ED 654804.L39</i>	2.552	3.712	3.147	-	3.147	2.247	3.009	3.088	3.183	Continuing	Continuing

Remarks

D. Acquisition Strategy

Conduct pre Engineering and Manufacturing Development (EMD) advanced component development to reduce risk prior to entering EMD phase.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>				Project (Number/Name) K41 / <i>Water And Petroleum Distribution - Ad</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
K41: <i>Water And Petroleum Distribution - Ad</i>	-	3.615	3.662	4.773	-	4.773	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops and demonstrates the potential of prototype equipment and technologies to satisfy petroleum storage, distribution, and quality surveillance system requirements. The Technology Development programs support the development and enhancement of rapidly deployable Petroleum and Water equipment. The mission includes developing fuel quality analysis systems; achieving greater capabilities in the removal of Nuclear, Biological, Chemical (NBC) and other contaminants from water sources; reducing the logistics footprint; alternative source water acquisition, reutilization and disposal systems to reduce the requirement for transport of water into the theater; water purification and waste water treatment and material systems to decrease the logistics footprint and employment time for the transfer of liquid logistics in joint operations area. This vital equipment enables the Army to achieve its mission by providing the Army with the means to be highly mobile and self-sustaining in very hostile joint operations areas. Future Force operations demand that combat systems be rapidly deployable to the theater, rapidly emplaced upon arrival, and rapidly relocated to support a fast moving non-linear battlefield.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: 3K Tactical Water Purification System (3K TWPS)	0.565	0.635	1.788	-	1.788
FY 2016 Accomplishments: Completed detailed system design and prepared Milestone B program documentation and analysis. Prepared for Preliminary Design Review (PDR). Conducted detailed technical review of piping and instrumentation design in preparation for PDR. Fabricated ISO structure and prepared for test. Conducted freshwater and saltwater testing of breadboard system to validate component design.					
FY 2017 Plans: Complete system design and development leading to Critical Design Review (CDR). Program Design Review (PDR) 3Qtr shelter test and achieve Milestone B.					
FY 2018 Base Plans: Conduct Critical Design Review. Build prototype and begin Technical Data Package (TDP) development. Test Readiness Review.					
Title: Early Entry Fluid Distribution System (E2FDS)	3.050	3.027	2.985	-	2.985
Description: The Early Entry Fluid Distribution System (E2FDS) is a rapidly emplaced, high-throughput petroleum distribution conduit system. The E2FDS consists of 5-mile systems that can be connected to each					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) K41 / <i>Water And Petroleum Distribution - Ad</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>other to form a pipeline trace up to 50 miles long. It can throughput 850,000 gallons of petroleum or 650,000 gallons of raw/non-potable water per day. E2FDS is emplacement at a rate of 25 miles per day and retrieved at a rate of 10 miles per day. The components are configured in stackable International Standards Organization (ISO) twenty foot equivalent units (TEU) for deployment and is Heavy Expanded Mobility Tactical Truck-Load Handling System (HEMTT-LHS), Palletized Load System (PLS) and PLS Trailer transportable. It includes a Command and Control Module (C2M) that allows for central control of the pipeline trace from a single location. The E2FDS complements the Inland Petroleum Distribution System (IPDS) by adding an early entry capability as well as a means for rapidly extending existing pipeline.</p> <p>FY 2016 Accomplishments: Conducted Source Selection Evaluation Board. Awarded of EMD contract.</p> <p>FY 2017 Plans: Award Increment 2 of EMD contract and conduct Program Design Review (PDR).</p> <p>FY 2018 Base Plans: Perform Developmental Testing (DT) on the E2FDS non-developmental components including the pump stations, employment and retrieval system and hose segments. Development of Technical Manual (TM).</p>					
Accomplishments/Planned Programs Subtotals	3.615	3.662	4.773	-	4.773

C. Other Program Funding Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PM PAWS Project L41 654804: <i>Logistics and Engineer Equipment</i>	3.228	8.363	8.005	-	8.005	14.468	9.510	9.581	9.697	Continuing	Continuing
- <i>Engineering Development L41</i>											
• Distribution Sys Petroleum & Water: <i>Distribution Systems Petroleum & Water MA6000</i>	35.381	120.896	47.597	-	47.597	49.027	52.589	46.825	36.885	Continuing	Continuing
• Quality Surveillance Equipment: <i>Petroleum Quality Analysis System R67500</i>	5.368	9.287	6.903	-	6.903	6.670	-	-	-	0	28.228

Remarks

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev	Project (Number/Name) K41 / Water And Petroleum Distribution - Ad

D. Acquisition Strategy

Develop engineering prototypes for the 3K Tactical Water Purification System (3K TWPS), Army Fuels Automated Management System (AFAMS), and select Non-Development Item (NDI) based on market surveys and proposals from industry. Based on market research a decision to award a competitive or sole source contract. E2FDS will conduct Developmental Testing (DT) and will test data to inform a fair opportunity decision for production. Army Fuels Automated Management System (AFAMS) sensors will require the development and testing of self-reporting sensors for all fuel storage tanks.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603804A / Logistics and Engineer Equipment - Adv Dev				Project (Number/Name) VR8 / Combat Service Support Systems - Ad			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
VR8: <i>Combat Service Support Systems - Ad</i>	-	3.749	4.401	5.062	-	5.062	3.769	4.009	3.684	3.161	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports development of critical soldier support and sustainment systems including shelter systems (rigid and soft wall), base camp subsystems, field service systems, mortuary affairs equipment, heaters, camouflage systems to counter emerging enemy threat technologies, and other combat service support equipment. These systems will fill identified theater distribution and services capability gaps, improve unit sustainability, improve resource and energy efficiency and increase combat effectiveness. This project supports Advanced Component Development and Prototyping of critical tactical support systems that support mobile Joint Service command and control, medical, and maintenance platforms. This project develops critical enablers that support the Quartermaster (QM) Force Transformation Strategy and The Army's Modular Capabilities by maintaining readiness through fielding and integrating new equipment. This project also ensures Army Expeditionary Forces are capable of rapid deployment and reduces sustainment requirements, related Combat Support/Combat Service Support (CS/CSS) demands in lift, combat zone footprint, and costs for logistical support.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Energy Efficiency Solutions and Zero-Footprint Base Camp	2.041	2.497	1.954	-	1.954
Description: Zero-Footprint Base Camp reduces the operational energy and logistics footprint of the expeditionary base camp system, with the goal being a significant reduction in fuel, water, and power requirements to sustain operations in the field in addition to reducing site preparation, maintenance, and spare parts requirements. Operating a base camp such as Force Provider requires a significant amount of logistics support and also produces an enormous amount of by products, both of which cost money, human effort (that means a risk in the form of soldiers on the road), and represents a potential vulnerability.					
FY 2016 Accomplishments: Conducted evaluation and demonstration of novel resource and operational energy saving technologies with focus on producing suitable technology demonstration prototypes and reducing technical risk. Identified promising technologies related to energy-efficient shelter systems transitioning from the Sustainability, Logistics Basing Science and Technology Objective Demonstration (SLB-STO-D) and integrated and evaluated them at the FT Devens Base Camp Integration Laboratory (BCIL). Transitioned promising Zero-Footprint Base Camp technologies related to environmental control, micro-grids, and efficient appliances into Engineering and Manufacturing Development (EMD) supporting Force Provider requirements and Office of the Secretary of					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) VR8 / <i>Combat Service Support Systems - Ad</i>

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Defense (OSD) Joint Expeditionary Basing Work Group initiatives. These efforts compliment improved shelter and subsystem efficiencies significantly reducing the fuel and resource demand on base camp operations.</p> <p>FY 2017 Plans: Conduct evaluation of integrated technologies that are transitioning from the RDECOM 6.3 programs in a realistic operating environment at the Ft Devens Base Camp Integration Laboratory (BCIL). Efforts are focused on proving out subsystem maturity and the potential of these technologies before transitioning into Engineering and Manufacturing Development (EMD) and putting them into operational use within the Army Force Provider base camps as Pre-Planned Product Improvements (P3I). Focus will be on evaluating technologies that will improve upon the environmental, resource, and energy efficiency performance of the base camp. Specifically, evaluate technologies transitioning from the Sustainability, Logistics Basing Science and Technology Objective Demonstration (SLB-STO-D). Prepare promising Zero-Footprint Base Camp technologies for transition into Engineering and Manufacturing Development (EMD) supporting Force Provider requirements and OSD Joint Expeditionary Basing Work Group initiatives.</p> <p>FY 2018 Base Plans: Conduct evaluation of integrated technologies that are transitioning from the RDECOM 6.3 programs in a realistic operating environment at the Ft Devens Base Camp Integration Laboratory (BCIL). Efforts are focused on proving out subsystem maturity and the potential of these technologies before transitioning into Engineering and Manufacturing Development (EMD) and putting them into operational use within the Army Force Provider base camps as Pre-Planned Product Improvements (P3I). Focus will be on evaluating technologies that will improve upon the environmental, resource, and energy efficiency performance of the base camp. Specifically, evaluate technologies in the areas of: resource and energy efficiency; renewable energy collection and storage; and smart base camp monitoring transitioning from the RDECOM 6.3 programs. Prepare promising technologies for transition into EMD supporting Force Provider requirements and OSD Joint Expeditionary Basing Work Group initiatives.</p>					
<p>Title: Black Waste Elimination for Small Base Camps (150 personnel)</p> <p>Description: Provides the capability to reduce/eliminate the black water generated by small base camps. The objective capability will reduce our sustainment requirements for backhauling black waste water as well as our risk of contaminating the environment with biological contaminants. This capability will significantly reduce reliance on external support and is a key capability required to move toward zero footprint base camps.</p> <p>FY 2018 Base Plans:</p>	-	-	0.821	-	0.821

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) VR8 / <i>Combat Service Support Systems - Ad</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Award contract to fabricate an integrated prototype that incorporates promising black waste elimination technologies that are transitioning from the RDECOM 6.3 program. Conduct evaluation in a realistic operating environment at the Ft Devens Base Camp Integration Laboratory (BCIL). Prepare for transition into Engineering and Manufacturing Development (EMD).					
<p>Title: Solid Waste Disposal for Small Base Camps</p> <p>Description: Provides an integrated waste management (reduction, treatment or disposal process) add-on capability that can safely process 1,000 lbs or more of mixed solid waste in a single day on site. Mixed solid waste produced on a single 150 person site must be properly managed through reduction, reuse, recycling, treatment, or disposal. Most of the waste is nonhazardous solid waste. Provides a substantial improvement over the current practice of burn pits that poses a health risk to Soldiers and/or the backhaul logistics burden.</p> <p>FY 2016 Accomplishments: Prepared and awarded contract for prototype design and fabrication.</p>	1.058	-	-	-	-
<p>Title: Ultralightweight Camouflage Net System (ULCANS)</p> <p>Description: ULCANS is durable, robust, snag resistant state of the art camouflage system that provides increased survivability against multi-spectral visual, infrared and radar threats, thermal signature suppression and significant thermal/solar reduction capability. ULCANS utilizes a snag-free design and is capable of use in all types of weather and climatic conditions except in heavy snow and winds. ULCANS variants are integrated systems that are very lightweight, easily deployable, versatile, user friendly and tailored to the equipment meeting the requirements of operations for combat systems, command and control equipment, logistic support sites, tactical facilities, and fixed facilities. RDT&E funding supports formal development of new ULCANS variants (Arctic, Urban) and necessary technology/signature enhancements for current ULCANS variants (Woodland and Desert).</p> <p>FY 2016 Accomplishments: Completed evaluation/demonstration of ULCANS technology enhancements in a realistic environment. Obtained Headquarters Department of the Army (HQDA) approval of ULCANS Increment I Capability Development Document (CDD) to support development of new Arctic/Urban variants and upgrades to existing Woodland/Desert variants. Initiated planning to support new development contract for ULCANS Increment I.</p> <p>FY 2017 Plans:</p>	0.240	0.250	-	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) VR8 / <i>Combat Service Support Systems - Ad</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Initiate Milestone B documentation and prepare solicitation to support ULCANS development contract for Arctic/Snow variant and technology enhancements to ULCANS Woodland/Desert variants.					
<p>Title: Expeditionary Waste to Energy System</p> <p>Description: The Expeditionary Waste to Energy System reduces the operational energy and logistics footprint of the expeditionary base camp system, with the goal of providing an integrated waste management and disposal process add-on capability that can safely process up to two tons of mixed solid organic waste in a single day on site with the energy associated with the management process being converted to usable energy in the form of fuel, heat and/or electric power. This capability will provide a safe and suitable means to dispose of waste in remote expeditionary base camps while reducing the fuel and power requirements to sustain operations in the field. This capability provides a substantial improvement over the current practice of burn pits and backhaul with associated vulnerabilities.</p> <p>FY 2016 Accomplishments: Conducted evaluation of integrated waste to energy technologies investigated under RDECOM 6.3 programs. Efforts focused on proving out maturity and the potential of these technologies for future development.</p> <p>FY 2017 Plans: Complete evaluation of integrated waste to energy technologies. Prepare solicitation for development of prototypes for testing. Transition program into EMD.</p> <p>FY 2018 Base Plans: Complete technology assessment and make down selection of alternatives for advanced development.</p>	0.410	1.654	0.553	-	0.553
<p>Title: Army Standard Family of Rigid Wall Shelters (ASF-RWS)</p> <p>Description: The ASF-RWS is a formal development program to modernize the Army's Standard Family of Rigid Wall Shelters by incorporating the latest shelter technologies in composites, corrosion resistance, lighting and energy efficient materials. The ASF-RWS Program supports four RWS families to develop approved Technical Data Packages (TDPs) for standard shelter procurements in support of materiel developers and program managers that require RWS to house their integrated systems. The ASF-RWS program will help eliminate the need for PMs to pursue customized development of rigid wall shelters to support their individual systems. ASF-RWS procurements are customer funded by PMs as a cost of their program. The ASF-RWS program will provide improved performance and add-on capabilities for four RWS family variants (1) Vehicle Mounted Shelters (2) Expandable & Non-Expandable, (3) Collapsible & Panelized, and (4) Bicons and Tricons.</p>	-	-	1.734	-	1.734

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603804A / <i>Logistics and Engineer Equipment - Adv Dev</i>	Project (Number/Name) VR8 / <i>Combat Service Support Systems - Ad</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<i>FY 2018 Base Plans:</i> Complete performance specification, solicitation, and release solicitation for ASF-RWS Family of Expandable/ Non-Expandable ISO RWS Variants development contract. Award development contract and procure test items for Family of Expandable/Non-Expandable ISO RWS Variants.					
Accomplishments/Planned Programs Subtotals	3.749	4.401	5.062	-	5.062

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• RDT&E 654804.VR7: <i>Combat Service Support Systems - RDTE 654804 VR7</i>	5.346	4.325	3.743	-	3.743	5.424	6.377	5.053	5.515	Continuing	Continuing

Remarks

D. Acquisition Strategy
Evaluate Integrated Technologies in a realistic operational environment and transition promising efforts into Engineering and Manufacturing Development (EMD). Accelerate Base Camp efficiency and safety initiatives to incorporate in deployed camps and/or incorporate during reset of equipment.

E. Performance Metrics
N/A

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	39.711	33.503	33.491	-	33.491	35.572	40.468	41.482	44.229	Continuing	Continuing
808: <i>DoD Drug & Vacc Ad</i>	-	15.408	14.914	14.372	-	14.372	14.353	16.515	16.948	17.457	Continuing	Continuing
811: <i>Mil HIV Vac&Drug Dev</i>	-	5.427	0.638	5.230	-	5.230	5.353	5.523	5.669	6.044	Continuing	Continuing
836: <i>Field Medical Systems Advanced Development</i>	-	14.476	17.951	13.604	-	13.604	15.570	18.134	18.560	20.413	Continuing	Continuing
FF4: <i>Counterdrug, DDR, Sys Development & Demonstration</i>	-	4.400	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.400
V57: <i>MEDEVAC Mission Equipment Package (MEP) - Adv Dev</i>	-	0.000	0.000	0.285	-	0.285	0.296	0.296	0.305	0.315	0.000	1.497

A. Mission Description and Budget Item Justification

This Program Element (PE) funds development of medical materiel within the early system integration portion of the System Development and Demonstration phase of the acquisition life cycle using 6.4 (Advanced Component Development and Prototype) funding. Program efforts support transition of promising Science and Technology candidate medical technologies (drugs, vaccines, medical devices, diagnostics, and mechanisms for detection and control of disease carrying insects) to larger scale testing in humans for safety and effectiveness. Programs are aligned to meet future force requirements identified within concept documents and organizational structures. This Program Element also provides funding for Food and Drug Administration (FDA) regulated human clinical trials to gain additional information about safety and effectiveness on the path to licensure for use in humans.

The Projects supported by this PE are:

Project 808 funds development of candidate medical countermeasures for infectious diseases of military relevance. Efforts include vaccines, drugs, diagnostic kits/ devices, and insect control measures. These funds support human clinical efficacy trials of the drug/vaccine in a larger group that are designed to assess performance and to continue safety assessments in a larger group of volunteers. Products from this Project will transition to PE 0604807A/Project 849.

Project 811 funds the development of military relevant human immunodeficiency virus (HIV) medical countermeasures. It provides funding for planning and conducting of human clinical trials in a group of healthy volunteers to assess the drug/vaccine for safety, tolerability, how the drug/vaccine is distributed, metabolized, and excreted from the body, and investigate the appropriate dose for therapeutic use. Products from this Project will transition to PE 0604807A/Project 812.

Project 836 funds the demonstration and validation of medical products for enhanced combat casualty care and follow-on care, including rehabilitation. This project also funds the human clinical trials that test the safety and effectiveness of biologics, devices and demonstration. Clinical trials are conducted in accordance with United States (U.S.) FDA regulations. Products from this project will transition to PE 0604807A/Project 832.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>
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Project VS7 funds program upgrades, retrofits, trains, and sustains the fleet of Medical Evacuation legacy helicopters that continue to play a major role in Iraq and Afghanistan. The approved force design increased the number of air frames in the force from 12 to 15 aircraft for 37 medical evacuation (MEDEVAC) companies. All products from this Project will transition to PE 0604807A/Project VS8.

These Projects are managed by U.S. Army Medical Materiel Development Activity (USAMMDA) and U.S. Army Medical Materiel Agency (USAMMA) of the U.S. Army Medical Research and Materiel Command.

Project FF4 funded Secretary of Defense approved counterdrug advanced development efforts used in a major re-design of the Forensic Toxicology Drug Testing Laboratory (FTDTL) information management system used to test urine samples for the presence of illegal drugs. The Drug Testing Program - Client Collection System (DTP-CSS) is comprised of several variations of a desktop application used to select service members for random drug testing, prepare labels for urine specimen bottles, and print corresponding chain-of-custody documents. This Project will standardize DTP-CSS across all services and migrate it to a Web-based system.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	31.962	33.503	28.678	-	28.678
Current President's Budget	39.711	33.503	33.491	-	33.491
Total Adjustments	7.749	0.000	4.813	-	4.813
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.151	-			
• Adjustments to Budget Years	4.500	0.000	4.813	-	4.813
• OSD Directed Transfer	4.400	0.000	0.000	-	0.000

Change Summary Explanation

Two program changes account for the difference in FY16 between previous and current President's Budgets:

First, a \$4.4 million increase in Fiscal Year (FY) 16 is due to an Office of the Secretary of Defense (OSD)-directed funding of Project FF4: Counterdrug, DDR, System Development & Demonstration. These funds are to be used for development by United States Army Medical Command (USAMEDCOM) of a standard Department of Defense (DoD) tracking system of lab samples collected at military units and tested for illegal drugs.

Second, a \$4.5 million adjustment in FY16 is due to a reprogramming of this amount from PE 0604807A/Project 812 Military HIV Vaccine & Drug Development to PE 0603807A/Project 811, Military HIV Vaccine & Drug Development.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity
2040: *Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)*

R-1 Program Element (Number/Name)
PE 0603807A / *Medical Systems - Adv Dev*

In FY18 the budget year adjustment of \$4.83M was primarily due to an adjustment of \$4.42M from PE 0604807A/Project 812 Military HIV Vaccine & Drug Development to PE 0603807A/Project 811, Military HIV Vaccine & Drug Development and minor adjustments in the other project lines.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>				Project (Number/Name) 808 / <i>DoD Drug & Vacc Ad</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
808: <i>DoD Drug & Vacc Ad</i>	-	15.408	14.914	14.372	-	14.372	14.353	16.515	16.948	17.457	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds development of candidate medical countermeasures for infectious diseases of military relevance. These efforts are in: vaccines, drugs, diagnostic kits/devices, and to determine if insects are infected with pathogenic organisms capable of infecting service members/preventive medicine measures. These funds support human clinical effectiveness (capacity to produce a desired size of an effect under ideal or optimal conditions) trials of the drug/vaccine in larger groups that are designed to assess how well the drug/vaccine works, and to continue safety assessments in a larger group of volunteers. Funding supports both technical evaluations and human clinical testing to assure the safety and effectiveness of medical diagnostic kits and devices. This work, which is performed in military laboratories or civilian pharmaceutical firms, is directed toward the prevention of disease, early diagnosis, and accelerated recovery time once diagnosed; to enhance battlefield readiness. All clinical trials are conducted in accordance with United States (U.S.) Food and Drug Administration (FDA) regulations, a mandatory obligation for all military products placed into the hands of medical providers or service members. Product development priorities are determined based upon four major factors: (1) the extent and threat of the disease within the Combatant Commands theater of operations, (2) the clinical severity of the disease, (3) the technical maturity of the proposed solution, and (4) the affordability of the solution (development and production).

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

	FY 2016	FY 2017	FY 2018
Title: DoD Drug and Vaccine Advanced Development	15.408	14.914	14.372
Description: Funding is provided for the following effort in the development of candidate medical countermeasures for military relevant infectious disease.			
FY 2016 Accomplishments: Dengue Tetravalent Vaccine: Continue to fund Dengue Tetravalent Vaccine until Fiscal Year (FY) 18 for additional two-year volunteer follow-up and data analysis on pivotal Phase 3 safety and effectiveness clinical trials required by the Thai Ministry of Public Health. Infectious Disease Diagnostic: Transition products from science and technology (S&T) in FY16. Begin preparation for field testing and evaluation of several product candidates to include: Scrub Typhus, Rickettsiae, and Sand Fly Fever. Dengue Vaccine Block II: Transition from S&T in FY16. Transition from Military Infectious Diseases S&T funding and prepare for Phase 2 safety and efficacy trial (24 to 300 subjects) of vaccine candidate in an adult/military population. Treatment for Resistant Wound Infections: Products will transition from S&T in FY16. Transition from Military Infectious Diseases S&T funding and begin preparation for safety and efficacy trials of drug candidate for the Treatment for Resistant Wound Infections. Next Generation Malaria Prophylaxis: Initiate a retinal safety study in FY16 and continue to prepare the protocols for any required soldier specific studies that is needed. Arthropod Control/Surveillance: Begin preparation for field testing and evaluation of several product candidates to include: Scrub Typhus, Rickettsiae, and Sand Fly Fever.			
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 808 / <i>DoD Drug & Vacc Ad</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Dengue Tetravalent Vaccine: Will transition to Program element (PE) 0604807A Project 849 in FY17. Infectious Disease Diagnostic products: In FY17 products within this area will move to the Rapid Diagnostic and Detection Devices. Dengue Vaccine Block II: Will continue to prepare for Phase 2 safety and efficacy trial (24 to 300 subjects) of vaccine candidate in an endemic population and plan/prepare for phase 2 studies (safety and efficacy 24 to 300 subjects) involving adult military/traveler population. Preparation will include candidate formulation evaluation in dengue human challenge studies. Treatment for Resistant Wound Infections: Products will transition in FY17 from the Military Infectious Diseases Advanced Technology program. Will begin preparation for safety and efficacy trials of drug candidate for the Treatment for Resistant Wound Infections. Next Generation Malaria Prophylaxis: Will continue the retinal (eye) safety study started in FY16 and will continue to prepare the protocols for any required soldier specific studies for FDA review. Arthropod Control/Surveillance: In FY17 products within this area will move to the Rapid Diagnostic and Detection Devices. Rapid Diagnostic and Detection Devices: In FY17 the Infectious Disease Diagnostic and Arthropod Control/Surveillance products have moved under this product title. Will continue field testing and evaluation of several product candidates to include: dengue, chikungunya and leptospirosis.</p> <p><i>FY 2018 Plans:</i> Dengue Vaccine Block II: Will continue clinical development of the dengue human infection model, a tool used to evaluate and down select candidates transitioning from S&T. Treatment for Resistant Wound Infections: Conduct safety and effectiveness clinical study. Next Generation Malaria Prophylaxis: Will continue the retinal (eye) safety study (3 year study) started in FY16. Will prepare the protocols for the required soldier specific studies needed for the FDA review. Rapid Diagnostic and Detection Devices (Infectious Disease Diagnostics (Multiple)): Will continue field testing and evaluation of several diagnostic product candidates to include: dengue, chikungunya and bacterial diarrhea.</p>			
Accomplishments/Planned Programs Subtotals	15.408	14.914	14.372

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

N/A

Remarks

D. Acquisition Strategy

Test and evaluate in-house and commercially developed products in extensive government-managed clinical trials to gather data required for FDA licensure and Environmental Protection Agency registration.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) 808 / DoD Drug & Vacc Ad
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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Medical Product Development Management Services Cost	Various	Not Applicable : Not applicable	18.355	1.180		2.130		2.520		-		2.520	Continuing	Continuing	Continuing
Medical Product Development Management Services Cost	PO	General Dynamics Information Technology, : Frederick MD	1.300	1.193		2.118		2.454		-		2.454	0.000	7.065	0.000
Subtotal			19.655	2.373		4.248		4.974		-		4.974	-	-	-

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Medical Product Development Cost	Various	Not applicable : Not applicable	25.987	2.443		2.036		2.803		-		2.803	Continuing	Continuing	Continuing
Product Development of Malaria Prophylaxis	Allot	TBD : TBD	1.010	-		-		-		-		-	0.000	1.010	0.000
Product Development of Malaria Prophylaxis	Allot	Armed Forces Research Institute of Medical Sciences : Cambodia	2.111	-		-		-		-		-	0.000	2.111	0.000
Product Development of Malaria Prophylaxis	Various	Walter Reed Army Institute of Research : Silver Spring, MD	3.000	-		-		-		-		-	0.000	3.000	0.000
Subtotal			32.108	2.443		2.036		2.803		-		2.803	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Medical Product Development Support Cost	Various	Not Applicable : Not applicable	10.649	2.545		2.527		-		-		-	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) 808 / DoD Drug & Vacc Ad
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Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Subtotal			10.649	2.545		2.527		-		-		-	-	-	-

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Medical Product Development T&E Cost	Various	Not applicable : Not applicable	46.202	4.947		2.803		3.251		-		3.251	Continuing	Continuing	Continuing
Dengue Block II	IA	WRAIR and AFRIMS : Silver Spring MD	0.000	-		0.900		1.144		-		1.144	0.000	2.044	0.000
Malaria Prophylaxis clinical trial	TBD	TBD : TBD	1.999	3.100		2.400		2.200		-		2.200	0.000	9.699	0.000
Subtotal			48.201	8.047		6.103		6.595		-		6.595	-	-	-

	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract										
Project Cost Totals											110.613	15.408		14.914		14.372		-		14.372	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 808 / <i>DoD Drug & Vacc Ad</i>
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
	Topical Antileishmanial Cream Expanded Access Treatment Pgm																											
Infectious Disease Diagnostics Assays Validation of point-of-care																												
Dengue Vaccine Block II Phase 2 safety trial preparation/perform																												
Arthropod Control / Surveillance Process Validation																												
Treatment for Resistant Wound Infections Phase 2 safety trial																												
Q Fever Vaccine IND and NDA package creation																												
D5P Next Generation Malaria Drug Clinical Studies																												
Oral Drug for Cutaneous Leishmaniasis Adult Indication Study																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 808 / <i>DoD Drug & Vacc Ad</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Topical Antileishmanial Cream Expanded Access Treatment Pgm	2	2011	1	2017
Infectious Disease Diagnostics Assays Validation of point-of-care	1	2016	1	2022
Dengue Vaccine Block II Phase 2 safety trial preparation/perform	1	2016	4	2019
Arthropod Control / Surveillance Process Validation	1	2016	1	2022
Treatment for Resistant Wound Infections Phase 2 safety trial	1	2016	4	2019
Q Fever Vaccine IND and NDA package creation	1	2015	4	2016
D5P Next Generation Malaria Drug Clinical Studies	1	2016	4	2017
Oral Drug for Cutaneous Leishmaniasis Adult Indication Study	1	2016	4	2019

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>				Project (Number/Name) 811 / <i>Mil HIV Vac&Drug Dev</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
811: <i>Mil HIV Vac&Drug Dev</i>	-	5.427	0.638	5.230	-	5.230	5.353	5.523	5.669	6.044	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds development of militarily relevant human immunodeficiency virus (HIV) medical countermeasures. It provides funding for the planning and conducting of human clinical trials in a group of healthy volunteers to assess the drug/vaccine for safety, tolerability, how the drug/vaccine is distributed, metabolized, and excreted from the body, and to investigate the appropriate dose for therapeutic use. Development efforts are focused on militarily unique needs effecting manning, mobilization, and deployment.

The major contractor is Henry M. Jackson Foundation for the Advancement of Military Medicine, Rockville, MD. Research efforts are coordinated with the National Institutes of Health.

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

	FY 2016	FY 2017	FY 2018
Title: Military HIV Vaccine & Drug Development	5.427	0.638	5.230
Description: This Project funds advanced development research to develop candidate HIV vaccines, assess their safety and effectiveness in evaluations with human subjects, and protect military personnel from risks associated with HIV infection.			
FY 2016 Accomplishments: In RV305 (a late boost study of RV144 vaccine recipients), coordinate final data analyses and meet with investigators as to how the data should be presented/published. Results of RV305 resulted in a rollover study (RV305 amendment) which provides an additional boost dose to selected vaccine recipients. Continue candidate vaccine trials RV306 (evaluation of different one-year boosts) and RV328 (study of AIDSVAX B/E alone) to produce further immunogenicity data that complement the RV305 data. Continue the RV403 in Mozambique, Uganda, and Thailand. Compare the studies of immune responses induced by the RV144 regimen using AIDSVAX B/E mixed with LMPLA (monophosphoryl lipid A with liposomes).			
FY 2017 Plans: Will complete the rollover RV305 study (RV305 Amendment) to provide additional open-label boost to willing volunteers. Will conduct analysis of samples from RV305A study and will coordinate to analyze and evaluate data from the study. Will continue to seek further complementary immunogenicity (ability to provoke immune response) data from Candidate vaccine trials RV306 and RV328 and will complete the collection of samples for safety and effectiveness of the study. RV403 study will continue in Mozambique, Uganda, and Thailand with adjuvanted AIDSVAX B/E and will continue to collect samples from volunteers. IPT will continue to review Analysis of Alternatives (AoA) and disruptive technologies that have the potential to refocus current vaccine effort to a product that has a greater utility for military relevant populations. Down selection of viable vaccine candidates will be			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 811 / <i>Mil HIV Vac&Drug Dev</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
made in anticipation of a single phase IIB efficacy trial (trials to evaluate efficacy in patients with the disease) in Fiscal Year (FY) 2018.			
<i>FY 2018 Plans:</i> Regional Vaccine Candidate: Will complete execution of cohort study in high risk population in Thailand in preparation for start of clinical trial to Phase IIb/III effectiveness testing (testing to determine safety and performance) of vaccine regimen. Global Vaccine Candidate: Will develop human safety study test plan for new HIV vaccine components. Will initiate regulatory and scientific reviews of human safety study test plan. Will prepare clinical safety study sites in Africa to execute the study of the global vaccine. Global vaccine has moved up in priority because it meets the manufacturing capability requirement and can meet the Capability Development Document threshold in one step as opposed to incrementally.			
Accomplishments/Planned Programs Subtotals	5.427	0.638	5.230

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

N/A

Remarks

D. Acquisition Strategy

Test and evaluate commercially developed drug/vaccine candidates in government-managed trials.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>				Project (Number/Name) 836 / <i>Field Medical Systems Advanced Development</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
836: <i>Field Medical Systems Advanced Development</i>	-	14.476	17.951	13.604	-	13.604	15.570	18.134	18.560	20.413	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds the demonstration and validation of medical products for enhanced combat casualty care and follow-on care, including rehabilitation. This Project funds human clinical trials to test the safety and effectiveness of biologics (products derived from living organisms) and devices necessary to meet medical requirements. When available, commercial-off-the-shelf (COTS) medical products are also tested and evaluated for transition to engineering and manufacturing development. Consideration is also given to reducing the medical logistics footprint through smaller weight, volume, and equipment independence from supporting materials. All clinical trials are conducted in accordance with United States (U.S.) Food and Drug Administration (FDA) regulations.

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

	FY 2016	FY 2017	FY 2018
Title: Field Medical Systems Advanced Development - Program Management (PM) Medical Devices	11.236	14.763	10.848
Description: Advanced Concept Development funding is provided for the following development of medical devices in support of enhanced combat casualty care.			
FY 2016 Accomplishments: Traumatic Brain Injury (TBI) Diagnostic Assay System Increment II Point of Care Device: TBI Diagnostic Assay System: Continue current Biomarker technology developed by Banyan and coordinate all known technologies to Abbott Diagnostics. Continue contracting efforts in Fiscal Year (FY) 16. Impedance Threshold Device for the Treatment of TBI: Product has transitioned back to science and technology (S&T) to conduct research on the expanded indications for the fielded device. Compartment Syndrome Pressure Device: Compartment Syndrome Pressure Device will be delayed for transition into Advanced Development from S&T until FY17. Milestone A will be delayed until FY17. After the Milestone A, product will transition into Advanced Development. Junctional / Noncompressible Hemorrhage Control Agent: The plan is for the product to transition into Advanced Development after Milestone B in late FY15. If FDA requires 510-K, program will develop required paper work for submission to the FDA.			
FY 2017 Plans: TBI Diagnostic Assay System Increment II Point of Care Device: Will continue to focus on the current Biomarker technology developed by Banyan and platform development with Abbott Diagnostics. Compartment Syndrome Pressure Device: Prior testing results will determine the Materiel solution pathway. The materiel solution will transition in FY17 as previously expected. Junctional / Noncompressible Hemorrhage Control Agent: Will continue FY16 efforts to scope effort and requirements. Intrathoracic Pressure Regulation Therapy (IPRT) (Formally Ventilator Support Device): Will work on validation efforts and preclinical testing to achieve FDA 510(k) clearance of the device to enhance circulation with possible applications towards shock			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 836 / <i>Field Medical Systems Advanced Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>and head injury. Will perform testing to ensure the IPRT product is compatible with existing fielded systems. PTSD Biomarkers: Pending favorable research results in FY16, will begin prototype device development. Field Anesthesia: Pending refinement of Service and Joint requirements, will transition technology to PE 0604807A Project 832. Ocular Drug Delivery (Ocular Salvage Device): Will determine products to move forward to clinical trials based on results from bench and preclinical studies. Portable Extracorporeal Membrane Oxygen (ECMO): Will evaluate development of more compact, portable and less invasive product from existing ECMO vendors.</p> <p>FY 2018 Plans: Compartment Syndrome Pressure Device: This Project transitioned to Defense Health Program funding in FY17. Junctional / Noncompressible Hemorrhage Control Agent: Developmental efforts will be completed and available for procurement. IPRT: Will perform operational and suitability testing. Achieve Milestone B. Field Anesthesia: Will be doing a pivotal clinical trial on the device and working to finalize the design for production and obtain FDA clearance/approval. Ocular Drug Delivery (Ocular Salvage Device): Will start clinical trials. Will complete Milestone A and finalize the capability development document. Portable ECMO: Will conduct clinical validation of prototype device. Work towards Milestone B accomplishment. Non-invasive neuro assessment device (NINAD): Product will transition to Advanced Development in FY18. Prepare for FDA submission and initiate clinical trials.</p>				
<p>Title: Field Medical Systems Advanced Development - PM Medical Support Systems</p> <p>Description: Funding is provided for the following effort in the development of products that support the medical mission in combat casualty care and health care operations.</p> <p>FY 2016 Accomplishments: Medical Evacuation and Treatment Vehicles Medical Equipment Set and Mission Essential Package: Continue collaboration with Program Executive Office Combat Support/Combat Service Support (PEO CS&CSS) and Program Executive Office Ground Combat Systems (PEO GCS) on development efforts for emerging medical vehicle evacuation/casualty evacuation (CASEVAC) variants including Armored Multi-Purpose Vehicle (AMPV) source selection. Exploring CASEVAC kit development for Mine-Resistant Ambush Protected (MRAP) Dash and Joint Light Tactical Vehicle (JLTV) vehicles. Transition to Project 832 in FY17. Improved Vector Tent Traps: Continue prototype development of Vector Tent Traps and transition to Project 832. Next Generation Uniform Repellent: Continue development of the Next Generation Uniform Repellent/Impregnation process in collaboration with PEO Soldier. Obtain EPA registration. Perform cut and sew testing of EPA approved uniform repellent/impregnation process for permethrin. Investigate use of other repellents. NGIS: Continue prototype development of NGIS and begin initial developmental tests and user evaluations. Hydration Status Monitor (HSM): HSM transition will be delayed due to a more extensive feasibility study than initially determined. Initiate development of prototype devices and prepare for the Milestone B submission with required documentation.</p> <p>FY 2017 Plans:</p>		3.240	3.188	2.494

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 836 / <i>Field Medical Systems Advanced Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Medical Evacuation and Treatment Vehicles, Medical Equipment Set and Mission Essential Package, and CASEVAC: Will transition to project PE 0604807A Project 832. Improved Flying Vector Trap (IFVT) (formerly Improved Vector Test Traps). Will transition to PE 0604807A Project 832. Next Generation Uniform Repellent/Impregnation: Will continue development of the Next Generation Uniform Repellent/Impregnation process in collaboration with PEO Soldier. Will obtain Environmental Protection Agency (EPA) registration on a different repellent and evaluate integration into the uniform manufacturing process. Litter Transport Shock/Stressor Mitigation System (formerly NGIS). Will finalize prototype design for transition to PE 0604807A Project 832 to conduct developmental test and user evaluations. Remote Triage Sensor System: Will transition the Remote Triage Sensor System from a Small Business/Innovative Research (SBIR) effort to PE 0604807A Project 836. Will finalize development of a fully functional prototype in preparation for developmental and user evaluations.</p> <p>FY 2018 Plans: Next Generation Uniform Repellent/Impregnation: Will transition to PE 0604807A/Project 832. Litter Transport Shock/Stressor Mitigation System (Formally: NGIS): Will transition to PE 0604807A/Project 832. Remote Triage Sensor System: Will transition to PE 0604807A/Project 832. Nett Warrior Enhanced Physiological Sensors (Wearable): Will collaborate with Program Executive Office Soldier on the development of wearable physiological sensors.</p>			
<p>Title: Field Medical Systems Advanced Development - PM Tissue Injury and Regenerative Medicine</p> <p>Description: Description: Funding for engineering and manufacturing development of tissue injury and regenerative medicine health products for enhanced medical capability and readiness</p> <p>FY 2018 Plans: Fracture Putty: Will transition 'Fracture Putty' scaffold product from Science & Technology. Will support Fracture Putty's scale-up development, validation, and required FDA regulatory activities to achieve a commercial product.</p>	-	-	0.262
Accomplishments/Planned Programs Subtotals	14.476	17.951	13.604

<p>C. Other Program Funding Summary (\$ in Millions) N/A</p> <p>Remarks</p>
<p>D. Acquisition Strategy Develop in-house or industrial prototypes in government-managed programs to meet military and regulatory requirements for production and fielding.</p>
<p>E. Performance Metrics N/A</p>

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0603807A / Medical Systems - Adv Dev				836 / Field Medical Systems Advanced Development							
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Medical Product Development Management Services Cost	Various	Not Applicable : Not applicable	41.188	0.623		3.124		1.009		-		1.009	Continuing	Continuing	Continuing
TBI Diagnostic Assay System - Increment II (benchtop/POC/ Bandits)	TBD	Banyan BioMarkers, Inc : Alachua FL	0.208	-		-		-		-		-	0.000	0.208	0.000
Impedance Threshold Device for the Treatment of Traumatic Brain Injury	TBD	Advance Circulatory Systems, Inc : Roseville, MN	0.154	-		-		-		-		-	0.000	0.154	0.000
Subtotal			41.550	0.623		3.124		1.009		-		1.009	-	-	-
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Product Development	TBD	TBD : TBD	0.932	-		-		-		-		-	0.000	0.932	0.000
Medical Product Development	TBD	ALL Product : Various	1.931	-		2.083		0.850		-		0.850	Continuing	Continuing	Continuing
Product Development of Freeze-dried plasma	TBD	TBD : TBD	8.778	-		-		-		-		-	Continuing	Continuing	Continuing
Point of Care Coagulation Profiler	TBD	TBD : TBD	0.000	0.385		-		-		-		-	0.000	0.385	0.000
TBI Diagnostic Assay System - Increment II (benchtop/POC/ Bandits)	TBD	Banyan BioMarkers, Inc : Alachua FL	6.737	6.494		3.200		-		-		-	0.000	16.431	0.000
Impedance Threshold Device for the Treatment of Traumatic Brain Injury	TBD	Advance Circulatory Systems Inc. : Roseville, MN	2.322	-		-		0.626		-		0.626	0.000	2.948	0.000
Compartment Syndrome Pressure Device	TBD	Twinstar : Minneapolis, MN	1.871	-		-		-		-		-	0.000	1.871	0.000
Hydration Status Monitor	TBD	Gaia Medical : LaJolla CA	0.841	-		-		-		-		-	0.000	0.841	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) 836 / Field Medical Systems Advanced Development
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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Noninvasive Neuromodulator TBI	TBD	TBD : TBD	0.000	2.036		-		2.298		-		2.298	0.000	4.334	0.000
PTSD	Various	TBD : Various locations	0.000	-		2.532		2.300		-		2.300	0.000	4.832	0.000
Ocular Salvage Device	Various	TBD : TBD	0.000	-		2.479		2.461		-		2.461	0.000	4.940	0.000
Field Anesthesia	TBD	TBD : Various	0.000	-		3.068		3.262		-		3.262	0.000	6.330	0.000
Field Sterilizer	TBD	TBD : TBD	0.000	3.515		-		-		-		-	0.000	3.515	0.000
Product Development	TBD	HemCon Medical Technologies : Tigard, Oregon	9.720	-		-		-		-		-	Continuing	Continuing	Continuing
Product Development	TBD	Banyan BioMarkers, Inc : Alachua FL	31.514	-		-		-		-		-	Continuing	Continuing	Continuing
Development of Platelet Derived Hemostatic agent	TBD	Fast Track Drugs & Biologics : Frederick, MD	1.800	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			66.446	12.430		13.362		11.797		-		11.797	-	-	-

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Medical Product Development Support Cost	Various	Not Applicable : Not applicable	44.997	0.723		0.744		0.548		-		0.548	Continuing	Continuing	Continuing
Subtotal			44.997	0.723		0.744		0.548		-		0.548	-	-	-

Remarks
No product/contract costs greater than \$1M individually.

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev	Project (Number/Name) 836 / Field Medical Systems Advanced Development
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Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Medical Product Development T&E Cost	TBD	Not applicable : Not applicable	36.993	0.700		0.721		0.250		-		0.250	Continuing	Continuing	Continuing
Subtotal			36.993	0.700		0.721		0.250		-		0.250	-	-	-

Remarks
No product/contract costs greater than \$1M individually.

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	189.986	14.476	17.951	13.604	-	13.604	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 836 / <i>Field Medical Systems Advanced Development</i>
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Ocular Salvage Device development	[Redacted]																											
									R&D development																			
Noninvasive Neuro Assessment Device development	[Redacted]																											
													R&D development															
Intrathoracic Pressure Regulation Therapy	[Redacted]																											
													R&D development															
Field Anesheesia									[Redacted]																			
													R&D development															

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) 836 / <i>Field Medical Systems Advanced Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Ocular Salvage Device development	2	2016	1	2021
Noninvasive Neuro Assessment Device development	1	2016	1	2023
Intrathoracic Pressure Regulation Therapy	4	2015	1	2023
Field Anesheesia	2	2017	3	2022

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>				Project (Number/Name) FF4 / <i>Counterdrug, DDR, Sys Development & Demonstration</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
<i>FF4: Counterdrug, DDR, Sys Development & Demonstration</i>	-	4.400	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.400
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Supports the Secretary of Defense approved counterdrug advanced development efforts used in a major re-design of the Forensic Toxicology Drug Testing Laboratory (FTDTL) information management system used to test urine samples for the presence of illegal drugs. The Drug Testing Program - Client Collection System (DTP-CSS) is comprised of several variations of a desktop application used to select service members for random drug testing, prepare labels for urine specimen bottles, and print corresponding chain-of-custody documents. This Project will standardize DTP-CSS across all services and migrate it to a Web-based system.

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

	FY 2016	FY 2017	FY 2018
Title: Development and demonstration of tracking laboratory urine samples used in drug testing	4.400	-	-
FY 2016 Accomplishments: Contract award pending.			
Accomplishments/Planned Programs Subtotals	4.400	-	-

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603807A / Medical Systems - Adv Dev				Project (Number/Name) VS7 / MEDEVAC Mission Equipment Package (MEP) - Adv Dev			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
VS7: MEDEVAC Mission Equipment Package (MEP) - Adv Dev	-	0.000	0.000	0.285	-	0.285	0.296	0.296	0.305	0.315	0.000	1.497
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Medical Evacuation Enroute Care Validation Study is completed in Fiscal Year (FY) 2015. Products from this project transition to Program element (PE) 0604807A/ Project VS8 in FY 16.

A. Mission Description and Budget Item Justification

Original models of Army Black Hawk Medical Evacuation (MEDEVAC) helicopters continue to play a major role in maintaining high United States (U.S.) troop survival rates in Iraq and Afghanistan by evacuating wounded troops in less than one-hour. In 2009 a Vice Chief of Staff, Army (VCSA)-approved force design update increased the number of air frames in the force from 12 to 15 aircraft for 37 MEDEVAC companies to better meet operational needs. In 2010, the U.S. Army Medical Department (AMEDD) accepted life-cycle management of the MEDEVAC Evacuation Package (MEP) from Program Executive Office (PEO)-Aviation. In order to achieve required operational capability and enhance commonality across the MEDEVAC fleet, the MEDEVAC MEP program upgrades, retrofits, trains, and sustains the 256 MEDEVAC legacy helicopters to achieve the medical capability provided by the HH-60M, which is factory built for the MEDEVAC mission.

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

	FY 2016	FY 2017	FY 2018
Title: Medical Evacuation Development	-	-	0.285
Description: This program will conduct Aeromedical Evacuation Cabin and Technology Research to determine the optimum space and configuration for performing necessary life-saving paramedic-level tasks. Program efforts will develop patient handling system components and prototypes to ensure paramedic skills and tasks are performed to standard to save Soldiers' lives during point of injury MEDEVAC Missions.			
FY 2018 Plans: Medical Evacuation Development: Aeromedical Evacuation Cabin and Technology Research will determine optimum space and configuration in order to perform necessary life-saving paramedic-level tasks. Will develop patient handling system components and prototypes to ensure paramedic skills and tasks are performed to standard to save Soldiers' lives during point of injury MEDEVAC Missions.			
Accomplishments/Planned Programs Subtotals	-	-	0.285

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603807A / <i>Medical Systems - Adv Dev</i>	Project (Number/Name) VS7 / <i>MEDEVAC Mission Equipment Package (MEP) - Adv Dev</i>
C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy Develop in-house or industrial prototypes in government-managed programs to meet military MEDEVAC and regulatory requirements for production and fielding.		
E. Performance Metrics N/A		

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	22.251	31.120	20.239	-	20.239	20.846	14.976	23.030	28.287	Continuing	Continuing
ET8: <i>Personnel Airdrop System Development</i>	-	0.000	0.690	0.495	-	0.495	0.400	0.300	1.282	1.280	0.000	4.447
S51: <i>Aircrew Integrated Sys Ad</i>	-	0.146	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.146
S53: <i>Clothing And Equipment</i>	-	9.758	3.582	2.612	-	2.612	1.845	2.495	1.831	2.445	Continuing	Continuing
S54: <i>Small Arms Improvement</i>	-	7.153	10.554	6.851	-	6.851	10.377	9.312	15.421	19.595	Continuing	Continuing
VS4: <i>Soldier Protective Equipment</i>	-	5.194	16.294	10.281	-	10.281	8.224	2.869	4.496	4.967	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) for Advanced Component Development and Prototypes manages the Soldier as a system in order to increase combat effectiveness, test and deliver tangible products that save Soldier's lives, and improve Soldier's quality of life. It evaluates, develops, and tests emerging technologies and critical Soldier support systems to reduce technology risk.

Project ET8 funding (Personnel Airdrop System) supports efforts to improve Static Line (SL) and Military Free Fall (MFF) personnel parachutes and associated equipment to include canopy improvements based on integration of new technology with the goal of enhancing the insertion capability of the airborne soldier and increasing the performance, safety and durability of personnel airdrop equipment.

Project S51 funding (Aircrew Integrated Systems) supports component development and prototyping of critical Soldier support systems and other combat service support equipment that will improve unit sustainability and combat effectiveness.

Project S53 funding (Clothing and Equipment) supports development of state-of-the-art technology to improve tactical and non-tactical clothing and individual equipment to enhance the lethality, survivability, and mobility of the individual Soldier.

Project S54 funding (Small Arms Improvement) provides funds to develop, demonstrate and evaluate emerging technology for integration of systems, subcomponents and prototypes designed to enhance lethality, target acquisition, fire control, training effectiveness and reliability for current and future small arms weapon systems and ammunition.

Project VS4 funding (Soldier Protective Equipment) supports efforts to evaluate integrated technologies and representative or prototype systems that help expedite Individual Soldier Ballistic Protection technology transition from the laboratory to operational use.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	22.994	31.120	23.067	-	23.067
Current President's Budget	22.251	31.120	20.239	-	20.239
Total Adjustments	-0.743	0.000	-2.828	-	-2.828
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.758	-			
• Adjustments to Budget Years	0.015	0.000	-2.841	-	-2.841
• Other Adjustments 1	0.000	0.000	0.013	-	0.013

Change Summary Explanation

FY 2018 decrease of \$2.828 million realigned to meet other Army higher priority requirements.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) ET8 / <i>Personnel Airdrop System Development</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
ET8: <i>Personnel Airdrop System Development</i>	-	0.000	0.690	0.495	-	0.495	0.400	0.300	1.282	1.280	0.000	4.447
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding line established in FY17 for the Personnel Airdrop System Development. Efforts were previously executed in Program Element 0603827A S53.

A. Mission Description and Budget Item Justification

This funding supports efforts to improve Static Line (SL) and Military Free Fall (MFF) personnel parachutes and associated equipment to include canopy improvements based on integration of new technology with the goal of enhancing the insertion capability of the airborne soldier and increasing the performance, safety and durability of personnel airdrop equipment. Includes integration and interface on the Soldier system.

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

	FY 2016	FY 2017	FY 2018
Title: Personnel Airdrop System Development	-	0.690	0.495
Description: Funding line is newly established in FY17. Efforts were previously executed in Program Element 0603827A S53.			
FY 2017 Plans: Continue to evaluate component and subsystem technologies across the airdrop portfolio to meet objective requirements for static line and military free fall parachutists and transition to ES9 to prove out capability insertions through Developmental Testing (DT) and Operational Testing (OT). Perform a market survey, system integration and initial evaluation of the performance modeling and analysis of parachute deployment to improve canopy performance.			
FY 2018 Plans: Investigate and initiate T-11 improvements to address improved packability and weight reduction to include packing methods as agreed to during Army Airborne Board. Validate average oxygen consumption during high altitude / high opening assessment to verify future oxygen requirements prior to integration into the Parachutists Oxygen Delivery System (PODS).			
Accomplishments/Planned Programs Subtotals	-	0.690	0.495

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) ET8 / <i>Personnel Airdrop System Development</i>
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• RDTE 654601 ES9: <i>RDTE 0604601A ES9 Advanced Tactical Parachute System</i>	-	1.487	5.840	-	5.840	7.200	6.694	1.851	3.000	0	26.072
• OPA MA7801: <i>OPA MA7801 Advanced Tactical Parachute System</i>	30.862	16.111	28.440	-	28.440	41.610	48.819	60.280	54.264	0	280.386

Remarks

D. Acquisition Strategy

Programs pursue technology maturation and prototype development, culminating in the transition of mature technologies (TRL 6-7) to Engineering and Manufacturing Development.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S51 / <i>Aircrew Integrated Sys Ad</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
S51: <i>Aircrew Integrated Sys Ad</i>	-	0.146	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.146
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Funding for this Project of S51 ends with FY2016.

A. Mission Description and Budget Item Justification

This project supports the Advanced Component Development and Prototyping of select Air Soldier System (Air SS) technologies. The Air SS provides improved safety, survivability, and human performance that amplifies the Warfighter's effectiveness and facilitates full-spectrum dominance of Army aircraft. The Air SS addresses capability gaps identified during combat operations in Iraq and Afghanistan including the effects of weight and bulk, limited situational awareness, and lack of functionally integrated aircrew member life support equipment. The Air SS follows an evolutionary acquisition approach that integrates mature technologies to build to the full capability. Air SS reduces overall weight and bulk of aircrew equipment, increases situational awareness, and enhances aircrew mobility. This funding provides advanced development for the Air SS in technology areas supporting improved laser eye protection, integrated power, wireless personal area networks, lightweight protective clothing, and tactile situational awareness cueing. Includes integration and interface of products on Soldiers.

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

	FY 2016	FY 2017	FY 2018
Title: Aircrew Integrated Systems (ACIS) Advanced Development	0.146	-	-
Description: Advanced Component Development and Prototyping (ACDP) of critical aircrew support systems technology improvements and Advanced Development (AD) and risk reduction efforts required for transition for insertion into Air Soldier System Program of Record.			
FY 2016 Accomplishments: Continue to resource laboratories to monitor and influence Air SS technologies to include advanced wireless battery charging and wireless personal area networks for transition into Air SS preplanned product improvements phase.			
Accomplishments/Planned Programs Subtotals	0.146	-	-

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• ACIS Engineering Development: <i>RDTE, A PE 0604601A PROJ S61-SDD</i>	3.380	3.811	4.011	-	4.011	3.992	2.063	1.919	1.958	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S51 / <i>Aircrew Integrated Sys Ad</i>

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

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• Aircrew Integrated Systems: <i>Aircraft Procurement,</i> <i>Army SSN AZ3110 - ACIS</i>	44.085	30.297	47.066	-	47.066	30.896	28.900	26.900	36.004	Continuing	Continuing

Remarks

D. Acquisition Strategy

Air SS employs an incremental acquisition approach to improve the mission effectiveness, survivability, Situational Awareness, and safety of Army aircrews. These funds resource various government agencies and labs in the transition of emerging technologies to the Air SS program.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) S53 / <i>Clothing And Equipment</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
S53: <i>Clothing And Equipment</i>	-	9.758	3.582	2.612	-	2.612	1.845	2.495	1.831	2.445	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding supports efforts to evaluate and integrate technologies and representative or prototype systems that help expedite Soldier uniform and clothing technology transition from the laboratory to operational use. Efforts focus on proving out commonality across as broad a spectrum of users as possible to provide a modular, integrated uniform/clothing system from skin out and head-to-toe. It funds efforts to investigate new technologies and domestically available fabrics with Flame Resistance (FR), moisture wicking, insect protection and camouflage technologies, including evaluation and integration of fabrics appropriate for uniforms and equipment used in jungle/tropical and arctic environments. New technologies are investigated to monitor health and improve Soldier survivability, reduce weight, and improve affordability, mobility and comfort in combat and training/administrative environments. Includes integration and interface on the Soldier system. It funds efforts to improve personnel parachutes, to include analysis of canopy cloth fabrics and pack volume techniques until transition to funding line ET8 in FY17.

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

	FY 2016	FY 2017	FY 2018
Title: Soldier Uniforms and Clothing	6.691	2.768	2.042
Description: Develop and provide superior and sustainable integrated clothing for the Soldier in a rapidly changing global environment.			
FY 2016 Accomplishments: Tactical Clothing. Conducted evaluations of new technologies to mitigate spectral reflectance of combat uniforms. Evaluated current products to establish performance metrics for incorporation in future specifications. Developed accurate digital objective color assessment technology to provide pass/fail shade assessments for quality control. Evaluated improved lighter weight textiles which incorporate improved vector protection, FR protection, and environmental protection while providing comfort, utility, and functionality for the Jungle Ensemble (uniform). Continued development of alternate insect protection with lower toxicity for all combat uniform fabrics (i.e. Army Combat Shirt, Army Combat Pants, FR Army Combat Uniform).			
FY 2017 Plans: Tactical Clothing. Conduct evaluation and integration of fabrics appropriate for uniforms and equipment used in jungle/tropical and Arctic environments. Continue to evaluate at the technical levels means to improve protection against cold weather, insects, and flame while increasing moisture management, signature management, breathability, and durability for tactical clothing. Develop characteristics and procure boot samples to refine product description and conduct small feasibility study to support Jungle Combat Boot requirement. Evaluate and Integrate technologies to support the development of accurate digital objective color assessment to provide pass/fail shade assessments for quality control. Investigate new fabrics and conduct laboratory testing to			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S53 / <i>Clothing And Equipment</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>support the New Army White Dress Shirt. Continue evaluation of new technologies to mitigate spectral reflectance Short Wave Infrared (SWIR) for combat uniforms.</p> <p>FY 2018 Plans: Tactical Clothing. Continue to evaluate and integrate technologies to support the development of accurate digital objective color assessment to provide pass/fail shade assessments for quality control and transition to DLA-TS. Evaluate improved lighter weight textiles which incorporate improved vector protection, FR protection, and environmental protection while providing comfort, utility, and functionality. Continue evaluation of new technologies to mitigate spectral reflectance Short Wave Infrared (SWIR) for combat uniforms. Develop durable antimicrobial technology transitioning from the S&T community to PdM SCIE for use in textiles used in combat uniforms and next-to-skin layers. Conduct evaluation and integration of insulative fabrics and technologies appropriate for clothing, handwear and footwear worn in extreme cold weather environments to be incorporated into environmental clothing, and hand and footwear systems. Initiate effort to improve the durability and reduce the fabric weight and cost to the sniper Flame Resistant Ghillie Suit.</p>				
<p>Title: Individual Equipment</p> <p>Description: Develop and provide superior and sustainable integrated individual equipment for the Soldier in a rapidly changing global environment.</p> <p>FY 2016 Accomplishments: Conducted Front End Analysis on Integrated Load Carriage System (ILCS) in 3QFY16 to inform technology integration requirements to ensure ILCS fully integrates with Soldier Protection System (SPS). Airdrop. Evaluated potential material solutions at the component level to enhance the T-11 and T-11R parachute systems to include potential pack tray redesign, packing loop configurations, and potential improvements to the slider, deployment sleeve and bridle. Determined technology readiness level and feasibility of integration an automatic opening device on static line parachute systems.</p> <p>FY 2017 Plans: Integrated Load Carriage. Obtain Material Development Decision (MDD) and initiate technical testing on the Integrated Load Carriage System (ILCS). The ILCS will provide an integrated load carriage that interfaces with the Soldier Protection System (SPS). Transition to S60 with MS B in 2QFY18.</p> <p>FY 2018 Plans:</p>		3.067	0.814	0.570

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S53 / <i>Clothing And Equipment</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Individual Equipment. Evaluate lighter textiles and component hardware to reduce bulk and weight of individual equipment items. Continue evaluation of new technologies to mitigate spectral reflectance of Short Wave Infrared (SWIR) of nylon used in load carriage.			
Accomplishments/Planned Programs Subtotals	9.758	3.582	2.612

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0604601A S60: <i>RDTE, 0604601A.S60, Clothing and Equipment</i>	5.814	10.166	7.022	-	7.022	5.413	7.528	8.803	5.075	Continuing	Continuing
• 121017 CFF OMA: <i>OMA, 121017, Central Funding and Fielding</i>	36.649	37.527	-	-	-	-	-	-	-	Continuing	Continuing
• MA7801 OPA: <i>OPA, MA7801, Advanced Tactical Parachute System</i>	30.862	16.611	28.440	-	28.440	41.610	48.819	60.280	54.264	Continuing	Continuing
• 121018 FR OMA: <i>OMA, 121018, Force Readiness Operations Support</i>	-	-	79.417	-	79.417	38.000	39.800	39.100	40.113	Continuing	Continuing

Remarks

D. Acquisition Strategy

Programs pursue technology maturation and prototype development, culminating in the transition of mature technologies (TRL 6-7) to Engineering and Manufacturing Development. This project continues to exercise competitively awarded contracts using best value source selection procedures.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
<i>S54: Small Arms Improvement</i>	-	7.153	10.554	6.851	-	6.851	10.377	9.312	15.421	19.595	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
 FY 2018 New Starts include Recoil Reduction Mechanisms, Armaments for Robots, Small Arms Deployable Observation Network, Sniper Rifle Round Counter, Lightweight Rifle/Machinegun Barrel Evaluations, Rifle/Machinegun Suppressor Evaluations, Next Generation Spotting Scope, Next Generation Binocular, and Sniper Missed Distance Corrective Offset.

A. Mission Description and Budget Item Justification

The Small Arms Improvement Advanced Component Development and Prototypes (ACD&P) program provides funds to mature, demonstrate, test and evaluate emerging technology from Joint Service Small Arms Program (JSSAP), Project 627, Program Element 0603607A, (Budget Activity 3), Defense Advanced Research Projects Agency (DARPA), Department of Energy National Laboratories, Research Development & Engineering Centers (RDECs) and other domestic and foreign sources for small arms weapons systems and technology. Small arms systems include weapons ranging up to 40 millimeter in caliber. Current and future efforts focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, usability, training effectiveness and reliability of weapons to include ammunition when developing and/or evaluating standard and non-standard weapons. Focus areas include the maturing of technology through testing and evaluation of sub-system or system prototypes which demonstrates light weight materials, wear resistant/protective/anti-reflective coatings, observation/situational awareness improvements, human-systems integration, robotic armament capability and equipment enhancements. Benefits include continuous improvements to small arms weapons, fire control equipment, optics, gun barrels, training devices, suppressors, component mounts, weapon mounts, and weapon/ammunition interface. Includes costs associated with efforts for integration and interface of products on Soldiers' head, body and weapons.

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

	FY 2016	FY 2017	FY 2018
Title: New Weapons	1.122	1.733	0.100
Description: Development of new small arms weapons			
FY 2016 Accomplishments: Next Generation Squad Automatic Rifle: Continued development of Acquisition Strategy, and supported Capability Development Document and provided Analysis of Alternatives for stakeholders. Externally Powered Mounted Machine Gun: Continued evaluation of metrics for externally powered weapon stations requirements. Provided engineering design and development activities to demonstrate capabilities of an Externally Powered Weapon system.			
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Next Generation Squad Automatic Rifle: Continuing coordination and development of Acquisition Strategy, Capability Development Document, Capability Production Document, and provide data from various technologies to better inform stakeholders for transition to Infantry Support Weapons.</p> <p>Externally Powered Mounted Machine Gun: Providing engineering design and development activities to demonstrate capabilities of an Externally Powered Weapon system to inform MCoE on the Capability Development Document. Functional objectives include increased lethality, expansion of mission roles and operational utility (using a single weapon) through enhanced precision and multiple firing modes, lightening of the load, reduction in physical footprint, and minimization of required electrical power consumption. Emphasis will also be placed on maintaining a proper balance with operational implementation and manufacturing producibility of the Externally Powered Weapon.</p> <p>FY 2018 Plans: Next Generation Squad Automatic Rifle: Will continue to support the finalization of the Capability Development Document and Acquisition Strategy/Plan and schedule to support the Engineering and Manufacturing Development phase for the Next Generation Squad Automatic Rifle and determine details for technologies that will be pursued to meet the Soldier requirements.</p> <p>Externally Powered Mounted Machine Gun: Will continue to support the development of the Capability Development Document with Maneuver Center of Excellence using data received from initial engineering design and prototype testing of functional objectives including increased lethality, expansion of mission roles and operational utility (using a single weapon) through enhanced precision and multiple firing modes.</p> <p>New Weapons Evaluations and Assessments: Will continue to perform initial evaluation and assessment of new weapons.</p>				
<p>Title: Small Arms Weapons Enhancements</p> <p>Description: Enhancements and developments of small arms weapons</p> <p>FY 2016 Accomplishments: Individual Non-Lethal System: Completed testing on commercial items and provided data to users for requirements preparation.</p> <p>Increased Barrel Life/Replace Chrome: Optimized choice of refractory material for barrel liner. Tailored explosive bonding methodology for liner emplacement to .50 caliber and 7.62mm barrels. Developed rifling capability using water jet technology for .50 caliber. Received prototype barrels and performed testing at Aberdeen. Evaluated test results and used lessons learned to optimize liner thickness for next round of test assets.</p>		1.085	1.686	0.100

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Non-Standard Weapons Assessments: Conducted baseline testing of commercial weapon systems and perform capability analysis of unique weapon characteristics. Tested information will be used to conduct trade off assessments of Non-Developmental Item solutions for pending requirements as well as establish safety parameters for the training mission. Continued to conduct market research of commercially available weapon systems.</p> <p>Small Business Innovative Research Enhancements: Continued to evaluate proposed improvement designs to enhance lethality, target acquisition and tracking, fire control, training effectiveness and reliability of weapons.</p> <p>Protective Weapons Coating: Continued to develop manufacturing technology to support production of super hydrophobic and other coatings in support of Small Arms Weapons.</p> <p>Weapon Upgrades and Accessories: Continued to test, evaluate and analyze ongoing and new activities to enhance small arms weapons.</p> <p>FY 2017 Plans: Individual Non-Lethal System: Complete Technology Transition Agreement between Program Executive Office Soldier and Armament Research Development and Engineering Center.</p> <p>Increased Barrel Life/Replace Chrome: Continue to conduct barrel studies to improve/enhance barrel life and eliminate chrome-lined weapon parts. Monitor progress in the Small Arms Ammunition Configuration Study and evaluate the effects on future barrel life/chrome requirements, e.g., caliber change or higher pressures. Develop needed technical approaches.</p> <p>Non-Standard Weapons Assessments: Continue to conduct baseline testing of commercial weapon systems and perform capability analysis of unique weapon characteristics. Continue to utilize test information to conduct trade off assessments of Non-Developmental Item solutions for pending requirements as well as establish safety parameters for the training mission of Regionally Aligned Forces. Continue to conduct market research of commercially available weapon systems.</p> <p>Small Business Innovative Research Enhancements: Continue to focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, training effectiveness and reliability of weapons.</p> <p>Protective Weapons Coating: Continue to develop manufacturing technology to support production of super hydrophobic and other coatings in support of Small Arms Weapons.</p>				

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Weapon Upgrades and Accessories: Continue to test, evaluate and analyze ongoing and new activities to enhance small arms weapons.</p> <p>FY 2018 Plans:</p> <p>FY 2018 New Start: Recoil Reduction Mechanisms: Will assess and evaluate selected Recoil Reduction Mechanisms prototypes will be fabricated and tested for both individual and crew served weapons.</p> <p>FY 2018 New Start: Armaments for Robots: Will begin to initiate the intelligence/networking and weapons design and functions for a man-in-the-loop, small caliber defensive armaments system on an unmanned ground vehicle including the Warfighter/Robot interface.</p> <p>FY 2018 New Start: Small Arms Deployable Observation Network: Will begin research of a low cost, prototype device from Armament Research, Development and Engineering Center and integration with a grenade launcher system. The grenade launcher will remotely deploy an observation device comprised of grenade nodes containing an Electro Optical camera, acoustic and magnetic sensor components networked via robust ad-hoc wireless communications capable of transmitting streaming audio and imagery to provide increased situational awareness.</p> <p>FY 2018 New Start: Sniper Rifle Round Counter: Will perform feasibility, analysis of alternatives, and cost-benefit analysis studies for a sniper weapon mounted shot counter (and support devices) and also assess the required Army Information Technology infrastructure and required data analysis with Army logistical elements to include Assistant Secretary of the Army (Acquisition, Logistics and Technology), Combined Arms Support Command and Tank-Automotive and Armaments Command. The Sniper Rifle Round Counter: is inherently a shot counter for reliability and maintainability system that collects a weapon's firing impulse/shock profile that is translated into diagnostic data to provide life cycle prognosis on individual weapon maintenance. It will increase a weapon's life span, reduce maintenance costs, and supports Army Condition Based Maintenance initiatives.</p> <p>FY 2018 New Start: Lightweight Rifle/Machinegun Barrel Evaluations: Will assess and evaluate new gun barrel technologies for both lightweight rifles and machine guns. Evaluation will consider technologies which are mature to where construction of test barrels can begin immediately for live fire evaluation. Technologies include dual and multilayer material gun barrels with refractory material bores, powdered metal liners, novel material (titanium/aluminum and other non-standard alloys) barrels.</p> <p>FY 2018 New Start: Rifle/Machinegun Suppressor Evaluations: Will assess and evaluate current technologies for small arms suppressors to address signature reduction requirements for Rifles and Machine Guns. Also determine characteristics for requirements for suppressors from evaluations to determine if new design is possible to meet requirements.</p>				

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Individual Non-Lethal System: Will continue to monitor status of Capability Development Document and provide input into programmatic documents as necessary.</p> <p>Increased Barrel Life/Replace Chrome: Will conduct test and evaluation of prototype barrels delivered in FY 2017. Will pursue barrel and liner designs that can withstand higher pressures per the Small Arms Ammunition Configuration Study outputs. Will further investigate and mature additive manufacturing and cold spray methodology for barrels.</p> <p>Non-Standard Weapons Assessments: Will continue to conduct baseline testing of commercial weapon systems and perform capability analysis of unique weapon characteristics. Will continue to utilize test information to conduct trade off assessments of Non-Developmental Item solutions for pending requirements as well as establish safety parameters for the training mission of Regionally Aligned Forces and establish a sustainment strategy for long term support of weapons procured to support the Regionally Aligned Forces training mission. Will continue to conduct market research of commercially available weapon systems.</p> <p>Small Business Innovative Research Enhancements: Future efforts will continue to focus on improvements designed to enhance lethality, target acquisition and tracking, fire control, training effectiveness and reliability of weapons.</p> <p>Protective Weapons Coatings: (includes Adaptive Lubricious Coatings): Will continue to develop manufacturing technology to support production of super hydrophobic and other coatings in support of Small Arms Weapons. Will assess and evaluate current manufacturing process studies and assessments to adapt the coating technology into weapon Original Equipment Manufacturer manufacturing processes.</p> <p>Weapon Upgrades and Accessories: Will continue to test, evaluate and analyze ongoing and new activities to enhance small arms weapons.</p>				
<p>Title: Ammunition</p> <p>Description: Small arms ammunition improvement</p> <p>FY 2016 Accomplishments: Small Arms Ammunition Configuration Study: Continued execution of tasks to support evaluation of feasible technical approaches that mitigate capability gaps prescribed in the Small Arms Capabilities Based Assessment.</p> <p>FY 2017 Plans:</p>		0.941	1.271	0.100

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
Small Arms Ammunition Configuration Study: Complete execution of tasks to support evaluation of feasible technical approaches that mitigate capability gaps prescribed in the Small Arms Capabilities Based Assessment. FY 2018 Plans: Ammunition Upgrades: Will continue to evaluate the effect of new ammunition on small arms weapons.				
Title: Combat Optics Description: Improvement of small arms combat optics FY 2016 Accomplishments: Optics Upgrades: Continued engineering evaluation, verification and validation of weapon optics performance requirements. FY 2017 Plans: Optics Upgrades: Will evaluate state of the art advances in optical component technologies for inclusion in future products, including Mounted Machinegun Optic Capability Production Document, Fire Control Capability Development Document, and its associated annexes. FY 2018 Plans: Optics Upgrades: Will continue to evaluate state of the art advances in optical component technologies for inclusion in future products, including Mounted Machinegun Optic Capability Production Document, Fire Control Capability Development Document, and its associated annexes.		0.053	0.400	0.100
Title: Fire Control Description: Small arms fire control FY 2016 Accomplishments: Advanced Hyperspectral Target Acquisition: Evaluated and analyzed advance approaches to acquire targets with the use of hyperspectral imaging and demonstrated capability. Small Arms Ballistic Kernel: Validated ballistic models through live fire evaluation and expand models to incorporate future weapon platforms. Fire Control Upgrades: Worked with the Infantry School to define the scope and assist in the development of Capability Development Document for the Army's Fire Control Upgrades for Small Arms Weapons consisting of individual weapons, sniper/precision, crew served weapons, low and high velocity 40mm. FY 2017 Plans:		3.852	5.364	6.350

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

	FY 2016	FY 2017	FY 2018
Small Arms Fire Control – Crew Program of Record: Will support Crew Served Fire Control requirements tests and studies, Milestone B documentation generation, and transition to 0604601AFF2: Infantry Support Weapons.			
Small Arms Fire Control – Squad Program of Record: Will conduct prototyping activities to advance fire control technologies on carbine and rifle weapon platforms. Will address Size, Weight, and Power trade space challenges associated with fire control on the individual squad weapons.			
Small Arms Fire Control – Crew Enhancements: Will support and oversight for exploring future fire control applications for Crew Served Weapons to include objective requirements of the Capability Development Document, Small Business Innovative Research, and digital enhancements.			
Small Arms Fire Control – Precision Enhancements: Will support the following precision fire control enhancements: target detection to improve battlefield reconnaissance and intelligence gathering capabilities, improve target acquisitions at extended ranges in all battlefield conditions, target tracking, down range wind sensing technology, bullet tracking, weapon bore sensor, automated muzzle velocity tracker to improve fire control accuracy, far-target location, battlefield networking, and augmented reality. To provide support to Small Business Innovative Research efforts that will explore the feasibility, scientific merit, research and development, and commercialization of future Precision fire control system.			
Small Arms Ballistic Kernel: Will integrate ballistic software into test hardware and platforms for validation of functionality. Will incorporate models for indirect 40mm weapon systems.			
Fire Control Upgrades: Will initiate testing of advanced fire control systems for small arms platforms to define the acquisition strategy in support of the Capability Development Document consisting of individual weapons, sniper/precision, crew served weapons, and low and high velocity 40mm.			
FY 2018 Plans:			
FY 2018 New Start: Next Generation Spotting Scope: Will consolidate readily available and mature fire-control/target acquisition component technologies into a variable magnification spotting scope.			
FY 2018 New Start: Next Generation Binocular: Will assess and evaluate incorporating existing target acquisition/fire control component technologies into binoculars.			
FY 2018 New Start: Sniper Missed Distance Corrective Offset: Will assess and evaluate from a sniper team (shooter's) location, tracks sniper's bullet trace to target to derive a missed distance correct offset for a follow-on shot.			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Small Arms Fire Control – Crew Program of Record: Will continue to support Crew Served Fire Control requirements tests and studies, Milestone B documentation generation, and transition to 0604601AFF2: Infantry Support Weapons.</p> <p>Small Arms Fire Control – Squad Program of Record: Will continue to conduct prototyping activities to advance fire control technologies on carbine and rifle weapon platforms. Will address Size, Weight, and Power trade space challenges associated with fire control on the individual squad weapons.</p> <p>Small Arms Fire Control – Crew Enhancements: Will continue support and oversight for exploring future fire control applications for Crew Served Weapons to include objective requirements of the Capability Development Document, Small Business Innovative Research, and digital enhancements.</p> <p>Small Arms Fire Control – Precision Enhancements: Will continue to support the following precision fire control enhancements: target detection to improve battlefield reconnaissance and intelligence gathering capabilities, improve target acquisitions at extended ranges in all battlefield conditions, target tracking, down range wind sensing technology, bullet tracking, weapon bore sensor, automated muzzle velocity tracker to improve fire control accuracy, far-target location, battlefield networking, and augmented reality. To provide support to Small Business Innovative Research efforts that will explore the feasibility, scientific merit, research and development, and commercialization of future Precision fire control system.</p> <p>Small Arms Ballistic Kernel: Will continue to integrate ballistic software into test hardware and platforms for validation of functionality. Will incorporate models for indirect 40mm weapon systems.</p> <p>Fire Control Upgrades: Will continue to initiate testing of advanced fire control systems for small arms platforms to define the acquisition strategy in support of the Capability Development Document consisting of individual weapons, sniper/precision, crew served weapons, low and high velocity 40mm.</p>				
<p>Title: Research and Analysis</p> <p>Description: Research and analysis of small arms</p> <p>FY 2016 Accomplishments: Initiated Market Research and Benefit Analysis of armaments for robots and other small arms research.</p> <p>FY 2017 Plans:</p>		0.100	0.100	0.101

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) S54 / <i>Small Arms Improvement</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Will initiate Market Research and Benefit Analysis of 360 degree situational awareness, active stabilization, advanced kinetic weapons, low flying drone engagement, and other small arms research.			
<i>FY 2018 Plans:</i> Will continue to initiate Market Research and Benefit Analysis of 360 degree situational awareness, active stabilization, advanced kinetic weapons, low flying drone engagement, and other small arms research.			
Accomplishments/Planned Programs Subtotals	7.153	10.554	6.851

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0604601AS63: <i>Infantry Support Weapons</i>	22.377	11.801	6.961	-	6.961	6.616	7.013	21.711	17.600	Continuing	Continuing
• 0604601AEW4: <i>Infantry Support Weapons</i>	-	14.447	9.251	-	9.251	9.952	10.229	23.388	19.045	Continuing	Continuing
• 0603607A: <i>Joint Service Small Arms Program</i>	4.903	5.839	5.796	-	5.796	5.885	6.004	6.124	6.249	Continuing	Continuing
• 0604601AFF2: <i>Infantry Support Weapons</i>	-	-	20.117	-	20.117	20.418	9.067	8.259	11.388	Continuing	Continuing

Remarks
In support of Small Arms Initial Capability and Capability Development Requirements, advanced technology of Small Arms Weapons is transitioned from Joint Service Small Arms Program (JSSAP), Project 627, Program Element 0603607A, (Budget Activity 3) to Small Arms Improvement, Project S54, Program Element 0603827A, (Budget Activity 4). After the technology is demonstrated and/or validated, the program transitions to Infantry Support Weapons, Program Element 0604601A, (Budget Activity 5) for engineering and manufacturing development.

D. Acquisition Strategy
Primary strategy is to study, develop, demonstrate and evaluate emerging technologies that ultimately lead to enhancing/improving the small arms inventory.

E. Performance Metrics
N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>				Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
VS4: <i>Soldier Protective Equipment</i>	-	5.194	16.294	10.281	-	10.281	8.224	2.869	4.496	4.967	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding supports efforts to evaluate integrated technologies and representative or prototype systems that help expedite Individual Soldier Ballistic Protection technology transition from the laboratory to operational use.

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

	FY 2016	FY 2017	FY 2018
Title: Soldier Protective Equipment (SPS)	5.194	16.294	10.281
Description: Funding line established in FY12. Effort was previously executed in Program Element 0603827 S53. Effort is to increase the Warfighter lethality and mobility by optimizing Soldier protection while effectively managing all life cycle aspects of Personal Protective Equipment (PPE).			
FY 2016 Accomplishments: Continued efforts to synchronize the integration of new and emerging technologies at the component and subsystem level focusing on reducing weight and bulk at the subsystem and component level. Continued to evaluate component and subsystem technologies and enabling technologies across the Personal Protection Equipment (PPE) portfolio (extremities, torso and vital torso, head, eye and face protection) to counter known and emerging ballistic/blast threats. Continued efforts to characterize and increase durability and functional service life of existing personal protective systems.			
FY 2017 Plans: Continue efforts to synchronize the integration of new and emerging technologies at the component and subsystem level focusing on reducing weight and bulk at the subsystem and component level. Continue evaluation of component and subsystem technologies and enabling technologies across the Personal Protection Equipment (PPE) portfolio (extremities, torso and vital torso, head, eye and face protection) to counter known and emerging ballistic/blast threats. Continue efforts to characterize and increase durability and functional service life of existing personal protective systems.			
FY 2018 Plans: Initiate Technology/Maturation and Risk Reduction efforts across the PPE portfolio (extremities, torso and vital torso, head, eye and face protection) to support SPS requirements for lighter weight ballistic materials with improved performance and manufacturing/testing process improvements. If ready, initiate proof-of-principle demonstrations on promising new materials, technologies and or appliqué in simulated and instrumented field exercises (LEAP-A, etc.) to evaluate SPS upgrades and inform stakeholders of new operational capabilities to enhance SPS. Continue efforts to characterize and increase durability			

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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
and functional service life of existing personal protective systems at the subsystem/component level. Continue to develop the methodology for PPE shelf and service life, and to advance the novel modeling method for PPE performance. Continue the development of improved projectile yaw and velocity measurement for existing systems and emerging requirements including evaluation of subsystem technologies to counter EOD threats.			
Accomplishments/Planned Programs Subtotals	5.194	16.294	10.281

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• Soldier Protective Equipment VS5: RDTE, 0604601A.VS5, Soldier Protective Equipment	14.659	2.141	1.758	-	1.758	6.122	6.856	8.582	9.943	0.000	50.061
• Central Funding & Fielding: OMA, 121017, Central Funding & Fielding	30.000	93.330	74.486	-	74.486	78.550	78.794	78.540	78.578	0.000	512.278

Remarks

D. Acquisition Strategy
Programs pursue technology maturation and prototype development, culminating in the transition of mature technologies (TRL 6-7) to Engineering and Manufacturing Development. This project continues to exercise competitively awarded contracts using best value source selection procedures.

E. Performance Metrics
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 4				PE 0603827A / Soldier Systems - Advanced Development				VS4 / Soldier Protective Equipment								
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management Support	Allot	PM SPIE Various : Various	0.050	0.300		0.450		1.009		-		1.009	0.000	1.809	0.000	
Subtotal			0.050	0.300		0.450		1.009		-		1.009	0.000	1.809	0.000	
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Dev/Sys Engineering Spt	MIPR	Various : Various	3.952	1.400		2.707		0.727		-		0.727	Continuing	Continuing	0.000	
Dev/Integ Contracts	TBD	Various : Various	12.172	1.794		7.550		5.861		-		5.861	Continuing	Continuing	Continuing	
Subtotal			16.124	3.194		10.257		6.588		-		6.588	-	-	-	
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Misc Support Costs	MIPR	Various : Various	1.200	0.700		2.025		0.200		-		0.200	Continuing	Continuing	Continuing	
Subtotal			1.200	0.700		2.025		0.200		-		0.200	-	-	-	
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Ballistic/Blast/Nonballistic Testing	MIPR	Various : Various	2.228	1.000		3.562		2.484		-		2.484	Continuing	Continuing	Continuing	
Subtotal			2.228	1.000		3.562		2.484		-		2.484	-	-	-	
Project Cost Totals			19.602	5.194		16.294		10.281		-		10.281	-	-	-	

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army							Date: May 2017			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>			Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>				
	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SPS Technology Upgrade Insertion																												
VTP Technology Upgrade Insertion																												
TEP Technology Upgrade Insertion																												
Helmet Technology Upgrade Insertion																												
(1) TCEP APEL Update																												



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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0603827A / <i>Soldier Systems - Advanced Development</i>	Project (Number/Name) VS4 / <i>Soldier Protective Equipment</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SPS Technology Upgrade Insertion	1	2017	4	2023
VTP Technology Upgrade Insertion	1	2020	4	2023
TEP Technology Upgrade Insertion	1	2020	4	2023
Helmet Technology Upgrade Insertion	1	2020	4	2023
TCEP APEL Update	1	2018	1	2018

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	39.608	-	39.608	69.070	16.728	17.254	7.251	Continuing	Continuing
FD2: <i>Soldier Robotics Systems</i>	-	0.000	0.000	1.512	-	1.512	2.812	3.728	4.254	4.251	0.000	16.557
FD3: <i>Battery Modernization & Interface Standardization</i>	-	0.000	0.000	0.847	-	0.847	0.858	0.000	0.000	0.000	0.000	1.705
FD9: <i>Robotics Systems</i>	-	0.000	0.000	37.249	-	37.249	65.400	13.000	13.000	3.000	Continuing	Continuing

Note

In FY2018 funding for Unmanned Ground Vehicles (UGV) Robotics Development (RD) transitions from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0604017A Robotics Development, Project FD2 Soldier Robotics Systems, and funding for Applique and Large Unmanned Ground Systems (ALUGS) Robotics Development (RD) transitions from PE 0604641A Tactical Unmanned Ground Vehicles, Project DV7 Small Unmanned Ground Vehicle to PE0604017A Robotics Development, Project FD9 Robotics Systems.

A. Mission Description and Budget Item Justification

Soldier Robotics Systems for Robotics Development (RD) includes efforts necessary to evaluate integrated technologies, validate materiel solutions, pre-materiel development decision activities in support of Analysis of Alternatives (AoA) activities for emerging requirements and programs of record. RD is designed to facilitate the transition of robotics and autonomous systems technology from Science and Technology (S&T) projects, REP initiatives and/or Small Business Innovative Research (SBIR) into emerging programs of record through development of emerging capabilities. This line is for robotic systems that are transported by individual Soldiers and vehicles. RD supports early evaluations for operational effectiveness studies of platforms (i.e. Common Robotics System (Vehicle) (CRS(V)), Common Robotics System (Individual) (CRS(I)), Light Reconnaissance Robot (LRR), Short Range Micro (SRM), Common Robotics System (Heavy) (CRS(H)), Explosive Ordnance Disposal Robotics Payload (ERP) and Chemical, Biological, Radiological, and Nuclear (CBRN)) to determine Technology Readiness Levels (TRL) and Manufacturing Readiness Levels (MRL). Studies support AoA that include Army Materiel Systems Analysis Activity (AMSAA), RAND Corporation studies, and/or modeling to increase confidence in the materiel solution defined in the emerging Capability Development Document (CDD)/Capability Production Document (CPD) that support appropriate Acquisition Category (ACAT), Milestone Decision Authority (MDA) and office of primary responsibility designations. This line also covers pre-acquisition activities intended to reduce risk of not fielding capabilities by the required date, such as market surveys, technical risk assessments, initial development of performance specifications, scopes of work, acquisition strategies, systems engineering plans, test & evaluation master plans, lifecycle sustainment plans, early test planning activities, and prototype development activities.

The Battery Modernization & Interface Standardization (BMIS) program was established to help bring greater power efficiency and effectiveness to the dismounted Soldier, and to reduce the proliferation of proprietary batteries across the Army. BMIS will develop the Army Standard Family of Batteries (SFoB,), a central acquisition management authority, and reduce 38 Communications-Electronics (C-E) battery types, currently in use, to just three. Battery standardization and policy enforcement will support Operational Readiness at a reduced cost to the Army while maintaining configuration management, life cycle support, safety standards, and technological upgrades.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>
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Robotics Systems for Applique and Large Unmanned Ground Systems (ALUGS) Robotics Development (RD) includes efforts necessary to evaluate integrated technologies, validate materiel solutions and determine initial studies and analyses in support of pre-materiel development decision activities for emerging requirements and programs of record. RD is designed to facilitate the transition of robotics and autonomous systems technology from Science and Technology (S&T) projects, and/or Small Business Innovative Research (SBIR) into emerging programs of record through development of emerging capabilities. This line is for robotic systems that are transported by vehicle, maneuver under their own power, or are installed as robotic applique kits. RD supports early evaluations for operational effectiveness studies of platforms (i.e. Leader/ Follower (LF), Automated Convoy Operations (ACO), Route Clearance & Interrogation System (RCIS) Type II, Robotic Wingman, etc.) to determine Technology Readiness Levels (TRL) and Manufacturing Readiness Levels (MRL). Studies support Analysis of Alternatives (AoA) that include Army Materiel Systems Analysis Activity (AMSAA), RAND studies, and/or modeling to increase confidence in the materiel solution defined in the emerging Capability Development Document (CDD)/Capability Production Document (CPD) that support appropriate Acquisition Category (ACAT), Milestone Decision Authority (MDA) and office of primary responsibility designations. This line also covers pre-acquisition activities intended to reduce risk of not fielding capabilities by the required date, such as market surveys, technical risk assessments, initial development of performance specifications, scopes of work, acquisition strategies, systems engineering plans, test & evaluation master plans, lifecycle sustainment plans, early test planning activities, and prototype development activities. Product Manager ALUGS will lead the development of a LF Software Integration Lab (SIL), in addition to Modeling and Simulation (M&S) efforts, to stress the systems and ultimately reduce Program of Record testing requirements through validated simulations.

Leader Follower will provide a limited autonomous vehicle capability to the Palletized Load System (PLS) A1. Leader Follower will provide capability for a manned Leader vehicle with up to seven (7) unmanned Follower vehicles. Initial efforts by the United States Army Tank Automotive Research, Development and Engineering Center (TARDEC) will control up to three (3) optionally manned Follower vehicles with a designated Leader vehicle. The manned Leader vehicle wirelessly provides direction and speed guidance to the Follower vehicles to follow the Leader vehicle with no driver input or unmanned. The primary purposes for Leader Follower are to improve Force Protection and increase Logistics Throughput. Funding allows the Army to demonstrate and operationally assess an unmanned vehicle capability with operational units and users to validate the technology.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	39.608	-	39.608
Total Adjustments	0.000	0.000	39.608	-	39.608
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	39.608	-	39.608

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army Date: May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>
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Change Summary Explanation

In FY2018 funding for Unmanned Ground Vehicles (UGV) Robotics Development (RD) transitions from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0604017A Robotics Development, Project FD2 Soldier Robotics Systems, and funding for Applique and Large Unmanned Ground Systems (ALUGS) Robotics Development (RD) transitions from PE 0604641A Tactical Unmanned Ground Vehicles, Project DV7 Small Unmanned Ground Vehicle to PE604017A Robotics Development, Project FD9 Robotics Systems.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>				Project (Number/Name) FD2 / <i>Soldier Robotics Systems</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
FD2: <i>Soldier Robotics Systems</i>	-	0.000	0.000	1.512	-	1.512	2.812	3.728	4.254	4.251	0.000	16.557
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2018 funding for Unmanned Ground Vehicle (UGV) Robotics Development (RD) will transition from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0604017A Robotics Development, Project FD2 Soldier Robotics Systems.

A. Mission Description and Budget Item Justification

Soldier Robotics Systems for Robotics Development (RD) includes efforts necessary to evaluate integrated technologies, validate materiel solutions, pre-materiel development decision activities in support of Analysis of Alternatives (AoA) activities for emerging requirements and programs of record. RD is designed to facilitate the transition of robotics and autonomous systems technology from Science and Technology (S&T) projects, Robotic Enhanced Program (REP) initiatives and/or Small Business Innovative Research (SBIR) into emerging programs of record through development of emerging capabilities. This line is for robotic systems that are transported by individual Soldiers and vehicles. RD supports early evaluations for operational effectiveness studies of platforms (i.e. Common Robotics System (Vehicle) (CRS(V)), Common Robotics System (Individual) (CRS(I)), Light Reconnaissance Robot (LRR), Short Range Micro (SRM), Common Robotics System (Heavy) (CRS(H)), Explosive Ordnance Disposal Robotics Payload (ERP) and Chemical, Biological, Radiological, and Nuclear (CBRN)) to determine Technology Readiness Levels (TRL) and Manufacturing Readiness Levels (MRL). Studies support AoA that include Army Materiel Systems Analysis Activity (AMSAA), RAND Corporation studies, and/or modeling to increase confidence in the materiel solution defined in the emerging Capability Development Document (CDD)/Capability Production Document (CPD) that support appropriate Acquisition Category (ACAT), Milestone Decision Authority (MDA) and office of primary responsibility designations. This line also covers pre-acquisition activities intended to reduce risk of not fielding capabilities by the required date, such as market surveys, technical risk assessments, initial development of performance specifications, scopes of work, acquisition strategies, systems engineering plans, test & evaluation master plans, lifecycle sustainment plans, early test planning activities, and prototype development activities.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Soldier Robotics Development	-	-	0.344	-	0.344
Description: Soldier Robotics Development is designed to facilitate the transition of robotics and autonomous systems technology from Science and Technology (S&T) projects into emerging programs of record. It informs the acquisition process beforehand allowing the Maneuver Center of Excellence (MCoE) the ability to make integration decisions and affordability trades while writing requirements.					
FY 2018 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD2 / <i>Soldier Robotics Systems</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Develop initial program cost estimates, conduct market surveys, perform Analyses of Alternatives (AoA), and initiate Request for Proposal (RFP) work for incorporation in the CDD/CPD.					
Title: UGV Robotics Development	-	-	1.168	-	1.168
Description: UGV Robotics Development will fund Common Robotic Systems Heavy (CRS-H), Explosive Ordnance Disposal Robotic Payload (ERP), and Chemical, Biological, Radiological, and Nuclear (CBRN) autonomy and mapping.					
FY 2018 Base Plans: Robotics Development is designed to facilitate the transition of robotics and autonomous systems technology from science and technology (S&T) projects into emerging programs of record. It informs the acquisition process beforehand allowing key stakeholders the ability to make integration decisions and affordability trades while writing requirements. Develop initial program cost estimates, conduct market surveys, perform Analyses of Alternatives (AoA), and initiate Request for Proposal (RFP) work for incorporation into the CDD/CPD.					
Accomplishments/Planned Programs Subtotals	-	-	1.512	-	1.512

C. Other Program Funding Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 603774A - Night Vision Systems Adva: VT7	7.003	10.321	12.347	-	12.347	8.435	6.779	6.828	7.451	Continuing	Continuing
• 0604710A - Night Vision Systems - E: L67	19.710	26.257	32.504	-	32.504	23.355	19.649	19.343	19.200	Continuing	Continuing
• Helmet Mounted Enhanced Vision Devi: (SSN K36400)	97.777	156.197	144.617	0.027	144.644	120.898	91.640	43.111	33.076	Continuing	Continuing
• Family of Weapons Sights - Individ: (SSN K22002)	30.194	55.536	49.887	-	49.887	89.769	83.246	80.685	19.900	Continuing	Continuing
• Family of Weapons Sights - Crew Ser: (SSN K22003)	-	-	1.033	-	1.033	31.469	78.822	86.403	95.575	Continuing	Continuing
• Family of Weapons Sights - Sniper (F: (SSN K22004)	-	-	8.185	-	8.185	15.753	26.467	16.555	1.728	Continuing	Continuing

Remarks

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army Date: May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD2 / <i>Soldier Robotics Systems</i>
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D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>				Project (Number/Name) FD3 / <i>Battery Modernization & Interface Standardization</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
FD3: <i>Battery Modernization & Interface Standardization</i>	-	0.000	0.000	0.847	-	0.847	0.858	0.000	0.000	0.000	0.000	1.705
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This project is a new start in FY 2018.

A. Mission Description and Budget Item Justification

The Battery Modernization & Interface Standardization (BMIS) program was established to help bring greater power efficiency and effectiveness to the dismounted Soldier, and to reduce the proliferation of proprietary batteries across the Army. BMIS will develop the Army Standard Family of Batteries (SFoB), a central acquisition management authority, and reduce 38 Communications-Electronics (C-E) battery types, currently in use, to just three. Battery standardization and policy enforcement will support Operational Readiness at a reduced cost to the Army while maintaining configuration management, life cycle support, safety standards, and technological upgrades.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Acquisition Strategy	-	-	0.212	-	0.212
Description: Complete advanced development pre-milestone B assessments and analysis.					
FY 2018 Base Plans: Complete advanced development pre-milestone B technology assessments and analysis. Conduct C-E battery market Research/Requests for Information (RFI). Develop Acquisition Strategy and Requests for Proposals (RFPs)					
Title: BMIS Standard Family of Batteries (SFoB) Design	-	-	0.635	-	0.635
Description: Conduct research and complete assessment of technology and portfolios. Establish a foundation for the development and usage of prototypes. Once the SFoB has been established, maintenance and updates will be made as technology advances.					
FY 2018 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD3 / <i>Battery Modernization & Interface Standardization</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Assess the current C-E Battery Portfolio. Complete the C-E Battery technology assessment. Determine a solid and integrated core Standard Family of Batteries that will align with the BMIS mission. Prepare solicitation for development of advanced prototype requirements for C-E batteries.					
Accomplishments/Planned Programs Subtotals	-	-	0.847	-	0.847

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

N/A

Remarks

D. Acquisition Strategy

BMIS will leverage full and open competition to award a contract for the engineering and development of the Army Standard Family of Batteries.

E. Performance Metrics

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>				Project (Number/Name) FD9 / <i>Robotics Systems</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
FD9: <i>Robotics Systems</i>	-	0.000	0.000	37.249	-	37.249	65.400	13.000	13.000	3.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2018, funding for Applique and Large Unmanned Ground Systems (ALUGS) Robotics Development transitions from PE 0604641A Tactical Unmanned Ground Vehicles to PE604017A Robotics Development, Project FD9 Robotics Systems.

A. Mission Description and Budget Item Justification

Robotics Systems for Applique and Large Unmanned Ground Systems (ALUGS) Robotics Development (RD) includes efforts necessary to evaluate integrated technologies, validate materiel solutions and determine initial studies and analyses in support of pre-materiel development decision activities for emerging requirements and Programs of Record. RD is designed to facilitate the transition of robotics and autonomous systems technology from Science and Technology (S&T) projects, and/or Small Business Innovative Research (SBIR) into emerging programs of record through development of emerging capabilities. This line is for robotic systems that are transported by vehicle, maneuver under their own power, or are installed as robotic applique kits. RD supports early evaluations for operational effectiveness studies of platforms (i.e. Leader Follower (LF), Automated Convoy Operations (ACO), Route Clearance & Interrogation System (RCIS) Type II, Robotic Wingman (RW), etc.) to determine Technology Readiness Levels (TRL) and Manufacturing Readiness Levels (MRL). Studies support Analysis of Alternatives (AoA) that include Army Materiel Systems Analysis Activity (AMSAA), RAND studies, and/or modeling to increase confidence in the materiel solution defined in the emerging Capability Development Document (CDD)/Capability Production Document (CPD) that support appropriate Acquisition Category (ACAT), Milestone Decision Authority (MDA) and office of primary responsibility designations. This line also covers pre-acquisition activities intended to reduce risk of not fielding capabilities by the required date, such as market surveys, technical risk assessments, initial development of performance specifications, scopes of work, acquisition strategies, systems engineering plans, test & evaluation master plans, lifecycle sustainment plans, early test planning activities, and prototype development activities. The Army Tank Automotive Research Development and Engineering Center (TARDEC) will build, and test prototype LF systems for safety release, Soldier use, and further technology maturation. Product Manager ALUGS will lead the development of a LF Software Integration Lab (SIL), in addition to Modeling and Simulation (M&S) efforts, to stress the systems and ultimately reduce Program of Record testing requirements through validated simulations.

Leader Follower (LF) will provide a limited autonomous vehicle capability to the Palletized Load System (PLS) A1. Leader Follower will provide capability for a manned Leader vehicle with up to seven (7) unmanned Follower vehicles. Initial efforts by the United States Army Tank Automotive Research, Development and Engineering Center will control up to three (3) optionally manned Follower vehicles with a designated Leader vehicle. The manned Leader vehicle wirelessly provides direction and speed guidance to the Follower vehicles to follow the Leader vehicle with no driver input or unmanned. The primary purposes for Leader Follower are to improve Force Protection and increase Logistics Throughput. Funding allows the Army to demonstrate and operationally assess an unmanned vehicle capability with operational units and users to validate the technology.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Leader Follower (LF) - PdM Applique & Large Unmanned Ground Systems (ALUGS)	-	-	6.264	-	6.264

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Description: Leader Follower (LF) Program in PdM ALUGS builds upon the Tank Automotive Research Development & Engineering Center (TARDEC) Leader Follower Excursion to provide a limited autonomous vehicle capability to the Palletized Load System (PLS) A1. Current PdM efforts will lay the groundwork for future Program of Record capability, expanding the TARDEC efforts to include up to seven (7) unmanned Follower vehicles. Funding will Recap ten (10) PLS trucks for testing purposes while the applique kits are procured through the TARDEC effort. Other efforts include Capabilities Document input, close monitoring of Excursion activities that feed cost estimates, capturing technical data, test data, test support, developing Modeling and Simulation (M&S) use cases and development of a Software Integration Lab (SIL).</p> <p>FY 2018 Base Plans: Funding supports attaining Recapitalized Palletized Load System (PLS) vehicles in an A1 configuration for test assets in support of the TARDEC Leader Follower Excursion applique kit purchase and install on these test vehicles; plus it funds follow on Program of Record technology insertions, technology transition and testing.</p> <p>M&S development and Initial prototype testing will refine the system performance to meet required leader follower system capabilities. Development of a Software Integration Lab (SIL), in addition to Modeling and Simulation (M&S) efforts that will stress the Leader Follower systems and ultimately reduce program of record testing requirements and costs through validated simulations.</p>					
<p>Title: Robotic Wingman (RW)/Automated Convoy Operations (ACO)</p> <p>Description: Robotic Wingman (RW) is a lethal ground vehicle system controlled by a command and control vehicle in close proximity. Automated Convoy Operations (ACO) is an advanced modular kit made of sensors and vehicle by-wire control hardware and software, designed to retrofit robotic capabilities onto both medium and heavy legacy Tactical Wheeled Vehicle Fleets. Robotics Development funding helps transition RW/ACO from Science and Technology (S&T) projects/demonstrations into program of record phases.</p> <p>FY 2018 Base Plans: FY 2018 funding supports Systems Engineering, Requirements, Cost Analysis, and technology transition plans.</p>	-	-	0.985	-	0.985
<p>Title: Leader Follower - Tank Automotive Research Development & Engineering Center (TARDEC) Excursion</p> <p>Description: Leader Follower provides a limited autonomous vehicle software and applique kit to the ten (10) ALUGS test Palletized Load System (PLS) A1s. For the TARDEC Excursion, the applique kit provides a designated manned Leader vehicle which leads a line of three (3) optionally manned Follower vehicles. The Leader vehicle wirelessly provides directional and speed guidance to the Follower vehicles to follow the</p>	-	-	30.000	-	30.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Leader vehicle with no driver input or unmanned. The primary purposes for Leader Follower is to improve Force Protection and increase logistics throughput. Funding allows the Army to demonstrate and operationally assess an unmanned vehicle capability with operational units and users to validate the technology. The Army will build, and test prototype systems for safety release, Soldier use, and further technology maturation.</p> <p><i>FY 2018 Base Plans:</i> FY 2018 funding allows the maturation and build of ten (10) Applique initial prototype Leader Follower systems for testing and safety assessment, applied to the ALUGS acquired ten (10) PLS A1 test vehicles. The prototypes will integrate a by-wire kit to the existing tactical vehicle to enable remote operation of steering, braking, throttle control and other functions. An autonomy kit will also enable the platforms to operate in leader/follower mode by providing sensor information and control algorithms to control the by-wire kit. M&S development and Initial prototype testing will refine the system performance to meet required leader follower system capabilities. In addition, the funding initiates long lead item purchases for up to one hundred and forty (140) Applique systems for user operational assessment, testing, and development planned in FY19 and FY20 on additional PLS trucks in FORSCOM identified units.</p>					
Accomplishments/Planned Programs Subtotals	-	-	37.249	-	37.249

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

N/A

Remarks

D. Acquisition Strategy

Robotics Development (RD) is designed to facilitate the transition of robotics and autonomous systems technology from Science and Technology (S&T) projects into emerging programs of record. It informs the acquisition process beforehand allowing key stakeholders the ability to make integration decisions and affordability trades while writing requirements.

Tank Automotive Armaments Research Development & Engineering Center (TARDEC) funding allows the Army to demonstrate and operationally assess an unmanned vehicle capability with operational units and users to validate the technology. The Army will build, and test prototype systems for safety release, Soldier use, and further technology maturation.

Product Manager Applique and Large Unmanned Ground Systems (PdM ALUGS) builds upon the TARDEC Leader Follower (LF) Excursion to provide a limited autonomous vehicle capability to the Palletized Load System (PLS) A1. Efforts include Capabilities Document input, close monitoring of Excursion activities that feed cost estimates, capturing technical data, test data, test support, developing Modeling and Simulation use cases and development of a Software Integration Lab.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army Date: May 2017

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
2040 / 4	PE 0604017A / <i>Robotics Development</i>	FD9 / <i>Robotics Systems</i>

Automated Convoy Operations (ACO)/Robotic Wingman (RW) FY 2018 funding supports Systems Engineering, Requirements, Cost Analysis, and technology transition plans.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>
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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Leader Follower Test Assets	MIPR	PdM HTV : Warren, MI	0.000	-		-		4.874	Oct 2017	-		4.874	0.000	4.874	0.000
Leader Follower (TARDEC) excursion A Kit	C/CPFF	Lokheed Martin : Camden, NJ	0.000	-		-		11.000	Apr 2018	-		11.000	0.000	11.000	0.000
Leader Follower (TARDEC) excursion B Kit	C/CPFF	Oshkosh : Oshkosh, WI	0.000	-		-		10.000	Apr 2018	-		10.000	0.000	10.000	0.000
Leader Follower (TARDEC) excursion Integrated System Integrator	C/CPFF	TBD : TBD	0.000	-		-		4.500		-		4.500	0.000	4.500	0.000
Leader Follower (TARDEC) excursion Warfighter Machine Interface	C/CPFF	DCS Corp : Boston, MA	0.000	-		-		2.500		-		2.500	0.000	2.500	0.000
Subtotal			0.000	-		-		32.874		-		32.874	0.000	32.874	0.000

Remarks
 LF Test Assets funding of \$4.874M of the ALUGS \$7M on a MIPR to PdM HTV secures the recap of ten (10) PLS A1s. This funding will be executed on the HTV Recap contract with Oshkosh to support testing and evaluation of Leader Follower solution developed in the Science & Technology TARDEC excursion.

Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
PdM ALUGS Support	MIPR	Various : Multiple locations	0.000	-		-		2.375		-		2.375	0.000	2.375	0.000
TARDEC Excursion support	MIPR	TARDEC : Warren, MI	0.000	-		-		1.000	Oct 2017	-		1.000	0.000	1.000	0.000
Subtotal			0.000	-		-		3.375		-		3.375	0.000	3.375	0.000

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date: May 2017**

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022											
	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								
	LEADER FOLLOWER ALUGS																																			
Leader/Follower (LF) Test Preparation Data Collection/Analysis																																				
Obtain LF PLS Vehicle Test Assets																																				
LF ALUGS MODELING & SIMULATION (M&S)																																				
LF M&S Data Source Matrix Development																																				
LF M&S Environment Development																																				
LF M&S Use Case Development																																				
LF M&S Validation, Verification Accreditation																																				
LF Milestone C Documentation																																				
(1) LF MS C																																				
LF LRIP																																				
ALUGS ROBOTIC WINGMAN(RW)/AUTOMATED CONVOY OPS(ACO)																																				
Robotic Wingman (RW)/ACO Studies & Analysis																																				

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date: May 2017**

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
TARDEC LEADER FOLLOWER EXCURSION																												
TARDEC LF Applique Prototype Build (10) for test									Applique Prototype Build & Integration (10)																			
TARDEC LF Order Items for 140 Applique Systems									Long Lead Item Order (140)																			
TARDEC LF Contractor Engineering Test									Contractor Test																			
ATEC LF Urgent Material Release (UMR) & Safety Test (TARDEC)													ATEC test															
TARDEC LF Applique Build (140) for Excursion													Build Excursion Applique Systems (140)															
(1) TARDEC LF Urgent Material Release (UMR)																	1 UMR											
(2) TARDEC LF First Unit of Issue																	2 FUI											
TARDEC LF Excursion Assessment																					Evaluate LF systems in FORSCOM units							

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604017A / <i>Robotics Development</i>	Project (Number/Name) FD9 / <i>Robotics Systems</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
LEADER FOLLOWER ALUGS	1	2017	4	2022
Leader/Follower (LF) Test Preparation Data Collection/Analysis	1	2017	4	2020
Obtain LF PLS Vehicle Test Assets	1	2018	4	2018
LF ALUGS MODELING & SIMULATION (M&S)	1	2017	4	2020
LF M&S Data Source Matrix Development	1	2017	4	2017
LF M&S Environment Development	4	2017	2	2018
LF M&S Use Case Development	1	2018	1	2019
LF M&S Validation, Verification Accreditation	4	2018	4	2019
LF Milestone C Documentation	3	2019	4	2020
LF MS C	4	2020	4	2020
LF LRIP	1	2021	1	2024
ALUGS ROBOTIC WINGMAN(RW)/AUTOMATED CONVOY OPS(ACO)	1	2017	4	2022
Robotic Wingman (RW)/ACO Studies & Analysis	1	2017	4	2022
TARDEC LEADER FOLLOWER EXCURSION	3	2018	3	2022
TARDEC LF Applique Prototype Build (10) for test	3	2018	4	2018
TARDEC LF Order Items for 140 Applique Systems	3	2018	4	2018
TARDEC LF Contractor Engineering Test	3	2018	2	2019
A TEC LF Urgent Material Release (UMR) & Safety Test (TARDEC)	2	2019	3	2020
TARDEC LF Applique Build (140) for Excursion	2	2019	4	2019
TARDEC LF Urgent Material Release (UMR)	1	2020	1	2020
TARDEC LF First Unit of Issue	1	2020	1	2020
TARDEC LF Excursion Assessment	1	2020	2	2021

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604100A / <i>Analysis Of Alternatives</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	7.533	6.608	9.921	-	9.921	9.870	10.139	10.211	10.347	Continuing	Continuing
EC7: <i>Analysis Of Alternatives</i>	-	7.533	6.608	9.921	-	9.921	9.870	10.139	10.211	10.347	Continuing	Continuing

A. Mission Description and Budget Item Justification

This PE provides funding for analytical support of Analysis of Alternatives (AoA). Based on Department of Defense Instruction (DoDI) 5000.02, AoAs are required to be completed for a new start program prior to its first Milestone (MS) Decision. AoAs are a statutory requirement for ACAT I and ACAT II programs and regulatory for ACAT III programs. The AoAs support the preparation of the Capability Development Document (CDD), Key Performance Parameters (KPP) and Thresholds within the CDDs and tradeoff analysis. The Army must complete an AoA prior to the MS A Decision in order to successfully achieve a MS A decision for new start programs. This PE provides central funding for new start programs prior to a materiel development decision which do not yet have a Program Manager assigned for materiel development. The cited work is consistent with the Assistant Secretary of Defense, Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy and Plan. Work in this PE is performed by analytical agencies such as U.S. Army TRADOC Analysis Center and U.S. Army Materiel Systems Analysis Activity. The Army is projecting to start work on several AoAs beginning in FY 2018, and will assess and fund the highest Army priorities during the year of execution.

FY 2018 funding in the amount of \$9.832 million supports of Analysis of Alternatives (AoA) for new start programs that do not yet have a Program Manager assigned.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	9.805	6.608	9.832	-	9.832
Current President's Budget	7.533	6.608	9.921	-	9.921
Total Adjustments	-2.272	0.000	0.089	-	0.089
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.389	-			
• Adjustments to Budget Years	-1.883	0.000	0.089	-	0.089

Change Summary Explanation

FY16 adjustments include \$0.389 million dollar transfer in support of SBIR/STTR and \$1.883 million realigned to meet higher priority requirements.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604100A / <i>Analysis Of Alternatives</i>				Project (Number/Name) EC7 / <i>Analysis Of Alternatives</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EC7: <i>Analysis Of Alternatives</i>	-	7.533	6.608	9.921	-	9.921	9.870	10.139	10.211	10.347	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This PE provides funding for analytical support of AoAs. Based on Department of Defense Instruction (DoDI) 5000.02, AoAs are required to be completed for a new program start prior to its first Milestone (MS) Decision. AoAs are a statutory requirement for ACAT I and ACAT II programs and regulatory for ACAT III programs. The AoAs support the preparation of the Capability Development Document, Key Performance Parameters and Thresholds within the CDDs and tradeoff analysis. The Army must complete an AoA prior to the MS A Decision in order to successfully achieve a MS A decision for new start programs. This PE provides central funding for new start programs prior to a materiel development decision which do not yet have a Program Manager assigned for materiel development. The cited work is consistent with the Assistant Secretary of Defense, Research and Engineering Science and Technology priority focus areas and the Army Modernization Strategy and Plan. Work in this PE is performed by analytical agencies such as U.S. Army TRADOC Analysis Center and U.S. Army Materiel Systems Analysis Activity. The Army will assess and fund the highest Army priorities during the year of execution.

FY 2018 funding in the amount of \$9.832 million supports of Analysis of Alternatives (AoA) for new start programs that do not yet have a Program Manager assigned.

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

	FY 2016	FY 2017	FY 2018
Title: Acquisition Analysis of Alternatives	7.533	6.608	-
Description: Funds are to be used for the following effort.			
FY 2016 Accomplishments: Centrally funded AoAs of the new start programs Dominating Mobility Through Terrain Shaping & Engagement and M113 Replacement at Echelons Above Brigade. Each of these programs will be assigned a Program Manager pending the results of their initial Milestone Decisions. Centrally funded a comprehensive update of a 2010 AoA to inform requirements and an acquisition strategy for Increment 1 of the existing Biometrics Enabling Capability.			
FY 2017 Plans: Centrally fund AoAs for new program starts that require a materiel development decision. These new programs do not yet have a Program Manager assigned.			
Title: Centrally fund AoAs for new program starts that require a materiel development decision. These new programs do not yet have a Program Manager assigned.	-	-	9.921
FY 2018 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604100A / <i>Analysis Of Alternatives</i>	Project (Number/Name) EC7 / <i>Analysis Of Alternatives</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Centrally fund AoAs for new program starts that require a materiel develop decision. These new programs do not yet have a Program Manager assigned.			
Accomplishments/Planned Programs Subtotals	7.533	6.608	9.921

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

N/A

Remarks

Not applicable for this item.

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Missile Defense (LTAMD) Capability
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	35.132	76.728	-	76.728	67.088	83.195	114.185	142.000	Continuing	Continuing
EX2: Lower Tier Missile Defense (LTAMD) Capability	-	0.000	35.132	76.728	-	76.728	67.088	83.195	114.185	142.000	Continuing	Continuing

Note

Starting in FY17, funding realigned from PE 0607865A, PATRIOT Product Improvement (Project DV8).

A. Mission Description and Budget Item Justification

Lower Tier Air Missile Defense (LTAMD) Capability program will provide the required sensing capabilities in the lower tier portion of the ballistic missile defense battlespace. The acquisition program will competitively select (full and open competition) the sensor/radar set (RS) to replace the baseline PATRIOT RS (AN/MPQ-65A) due to threat changes and the growing obsolescence and high Operational & Support (O&S) cost of the existing RS. The LTAMD Capability will address critical capability gaps, modernize technology, reduce O&S costs, mitigate obsolescence, and increase reliability and maintainability. The LTAMD Capability will increase sensor/radar performance to maximize the inherent PAC-3 Missile Segment Enhanced (MSE) Interceptor capabilities to engage threats.

Lower Tier Air Missile Defense (LTAMD) Capability tasks include the programmatic and engineering activities needed for LTAMD-Capability post Milestone A activities, and preparation required to execute the competitive Technology Maturity and Risk Reduction (TMRR) contract. Once proposed TMRR material solution have been evaluated, the development effort for LTAMD Capability will be continued into the Engineering and Manufacturing Development (EMD) phase to enable the prototyping, development, and testing of the LTAMD Capability.

FY2018 base dollars in the amount of \$76.728 million continues Lower Tier Missile Defense Capability to include programmatic and engineering activities needed for TMRR activities described above.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604114A / <i>Lower Tier Missile Defense (LTAMD) Capability</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	35.132	93.208	-	93.208
Current President's Budget	0.000	35.132	76.728	-	76.728
Total Adjustments	0.000	0.000	-16.480	-	-16.480
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	-16.480	-	-16.480

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Missile Defense (LTAMD) Capability				Project (Number/Name) EX2 / Lower Tier Missile Defense (LTAMD) Capability			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EX2: Lower Tier Missile Defense (LTAMD) Capability	-	0.000	35.132	76.728	-	76.728	67.088	83.195	114.185	142.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Lower Tier Air Missile Defense (LTAMD) Capability program will provide the required sensing capabilities in the lower tier portion of the ballistic missile defense battlespace. The acquisition program will competitively select (full and open competition) the sensor/radar set (RS) to replace the baseline PATRIOT RS (AN/MPQ-65A) due to threat changes and the growing obsolescence and high Operational & Support (O&S) cost of the existing RS. The LTAMD Capability will address critical capability gaps, modernize technology, reduce O&S costs, mitigate obsolescence, and increase reliability and maintainability. The LTAMD capability will increase sensor/radar performance to maximize the inherent PAC-3 Missile Segment Enhanced (MSE) Interceptor capabilities to engage threats.

Lower Tier Air Missile Defense (LTAMD) Capability tasks include the programmatic and engineering activities needed for LTAMD-Capability post Milestone A activities, and preparation required to execute the competitive Technology Maturity and Risk Reduction (TMRR) contract. Once proposed TMRR material solution have been evaluated, the development effort for LTAMD Capability will be continued into the Engineering and Manufacturing Development (EMD) phase to enable the prototyping, development, and testing of the LTAMD Capability.

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

	FY 2016	FY 2017	FY 2018
Title: Lower Tier Missile Defense Sensor	-	35.132	76.728
Description: Begins Lower Tier Missile Defense Capability.			
FY 2017 Plans:			
-Begins Lower Tier Missile Defense Capability to include programmatic and engineering activities needed for the Material Development, Analysis of Alternatives (AoA) and Business Case Analyses/Trades.			
-Perform requirements analysis of the PATRIOT Antenna Transmitter Upgrade (ATU), Performance Specification and requirements allocation to hardware and software components.			
-Initiate planning for demonstration of the Subscale Active Electronically Scanned Array (AESA) Prototype Antenna and Preliminary Design Review (PDR) for the full-scale LTAMDS AESA Antenna.			
FY 2018 Plans:			
-Continue Lower Tier Missile Defense Sensor programmatic and engineering activities needed for the TMRR phase including contract award and execution, and best value and business case analyses/trades.			
-Continue performance requirements analysis of LTAMD Performance Specification and requirements allocation to hardware, and software components through twelve knowledge-point-centric demonstration events directly linked to risk reduction			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Missile Defense (LTAMD) Capability	Project (Number/Name) EX2 / Lower Tier Missile Defense (LTAMD) Capability

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
-Conduct a Systems Requirements Review (SRR), System Functional Review (SFR) to demonstrate readiness for hardware and software designs. -Continue planning, execution, and analysis for three contractors to demonstrate their respective materiel solutions for LTAMD capability requirements by a competitive "sense-off" demonstration at a government test range. -Government-Furnished Equipment (GFE) preparation.			
Accomplishments/Planned Programs Subtotals	-	35.132	76.728

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• 0607865A Project: DV8: <i>Patriot Product Improvement</i>	87.537	49.482	90.217	-	90.217	69.976	41.973	62.928	80.407	Continuing	Continuing

Remarks

D. Acquisition Strategy
The objective of the Lower Tier Air Missile Defense Capability is to provide full and open competition for industry to provide their respective materiel solutions in an accelerated TMRR through EMD acquisition strategy. The non-prescriptive technical solutions provide maximum technical flexibility for industry to satisfy LTAMD capability requirements related to the implementation of an LTAMD Sensor/Radar Set to replace the current force (PATRIOT) RS. The knowledge-point-centric assessment approach during the TMRR phase enables the government to down-select to the single best contractor for EMD using best value trade-off determination techniques. This accelerated TMRR-to-EMD approach will provide overmatch capability against the emerging threat, refine the best materiel solution for LTAMD capability requirements, fosters full and open competition, reduces programmatic & technical risks, and substantially reduces total ownership cost (compared to the baseline RS being replaced by this LTAMD capability).

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0604114A / Lower Tier Missile Defense (LTAMD) Capability				EX2 / Lower Tier Missile Defense (LTAMD) Capability							
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Government Program Management	MIPR	Various : Redstone Arsenal, AL	0.000	-		7.620	Oct 2016	8.000	Oct 2017	-		8.000	Continuing	Continuing	0.000
Government Furnished Equipment Modification	C/FFP	Various : Huntsville, AL	0.000	-		24.512	Jun 2017	39.300	Feb 2018	-		39.300	Continuing	Continuing	0.000
Systems Engineering and Technical Assistance (SETA)	Various	Systems Engineering and Technical Assistance : Hutnsville, AL	0.000	-		3.000		3.000	Oct 2017	-		3.000	Continuing	Continuing	0.000
Subtotal			0.000	-		35.132		50.300		-		50.300	-	-	0.000
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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
Technical Maturation and Risk Reduction (TMRR)	C/TBD	TBD : TBD	0.000	-		-		23.428	Sep 2018	-		23.428	Continuing	Continuing	0.000
Subtotal			0.000	-		-		23.428		-		23.428	-	-	0.000
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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 Planning/Targets/Interceptors/U.S. Other Government Agencies (OGAs)	MIPR	RDEC, SED, WSMR-T&E Support : Huntsville, AL; White Sands, NM	0.000	-		-		3.000	Dec 2017	-		3.000	Continuing	Continuing	0.000
Subtotal			0.000	-		-		3.000		-		3.000	-	-	0.000
Project Cost Totals			0.000	-		35.132		76.728		-		76.728	-	-	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army							Date: May 2017			
Appropriation/Budget Activity 2040 / 4			R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Missile Defense (LTAMD) Capability			Project (Number/Name) EX2 / Lower Tier Missile Defense (LTAMD) Capability				
	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date: May 2017**

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Missile Defense (LTAMD) Capability	Project (Number/Name) EX2 / Lower Tier Missile Defense (LTAMD) Capability
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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 A												▲ MS A																
(2) TMRR Contract Award																▲ TMMR CA												
(3) Preliminary Design Review																					▲ PDR							
Technology Maturation and Risk Reduction																												
(4) Milestone B																												▲ MS B

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604114A / Lower Tier Missile Defense (LTAMD) Capability	Project (Number/Name) EX2 / Lower Tier Missile Defense (LTAMD) Capability

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Milestone A	4	2018	4	2018
TMRR Contract Award	4	2018	4	2018
Preliminary Design Review	4	2019	4	2019
Technology Maturation and Risk Reduction	4	2018	4	2020
Milestone B	4	2020	4	2020

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604115A / <i>TECHNOLOGY MATURATION INITIATIVES</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	34.493	70.047	115.221	-	115.221	96.372	100.740	107.350	110.775	Continuing	Continuing
DS3: <i>TECHNOLOGY MATURATION INITIATIVES</i>	-	34.493	45.047	115.221	-	115.221	96.372	100.740	107.350	110.775	Continuing	Continuing
EX3: <i>Ground Vehicle Prototyping</i>	-	0.000	25.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	25.000

A. Mission Description and Budget Item Justification

This Program Element (PE) funds experimental prototyping and demonstration of selected technology enabled capabilities to support advanced ground systems, aviation systems, command, control, communications & reconnaissance systems and equipment, precision weapons, High Energy Laser (HEL) systems, and Soldier equipment. Funding facilitates maturation and demonstration of advanced technologies and systems in relevant environments and tactical/operational scenarios, as well as the maturation and demonstration of a robust Virtual Proving Ground (VPG) for rapid, accurate, and computational prototyping of major Army platforms. Benefits include maturing technologies to a goal of Technology Readiness Level (TRL) 7, informing emerging requirements for future systems, and reducing technology risk in order to facilitate transition of new capabilities into acquisition programs. In Project DS3, Technology Maturation Initiative efforts mature and integrate advanced component technologies into system and sub-system technology demonstrators and experimental prototypes, which are then validated and transitioned to priority Army experimentation efforts and programs of record. Computational Prototyping Environment (CPE) efforts include demonstration of physics-based, computational modeling integrated with new advances in deep learning to explore design tradespaces and understand defeat strategies for prototypic platforms. Project EX3 funds experimental prototyping and demonstration of ground vehicles to assess future concepts and designs against selected capability trades, and emerging technologies for current and future combat vehicles across the combat vehicle portfolio. This PE provides the Army an improved mechanism for enabling greater competition in the latter stages of technology maturation and establishes a closer alignment between Science and Technology (S&T) efforts and acquisition programs.

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

Work in this PE is performed by the Research, Development and Engineering Command (RDECOM), Engineering Research Development Center (ERDC), and US Army Space and Missile Defense Command/Army Forces Strategic Command (SMDC/ARSTRAT).

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604115A / <i>TECHNOLOGY MATURATION INITIATIVES</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	35.917	70.047	57.378	-	57.378
Current President's Budget	34.493	70.047	115.221	-	115.221
Total Adjustments	-1.424	0.000	57.843	-	57.843
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.424	-			
• Adjustments to Budget Years	0.000	0.000	57.843	-	57.843

Change Summary Explanation

FY2018 decreased for transfer of Project EX3, Ground Vehicle Prototyping (-25.000); decreased Vehicle Survivability Subsystem Demonstrator (-0.157), and increased for Multi-Mission High Energy Laser (MMHEL) (+82.000) and Computational Prototyping Environment (+1.000) efforts under Project DS3, Technology Maturation Initiatives.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604115A / <i>TECHNOLOGY MATURATION INITIATIVES</i>				Project (Number/Name) DS3 / <i>TECHNOLOGY MATURATION INITIATIVES</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
DS3: <i>TECHNOLOGY MATURATION INITIATIVES</i>	-	34.493	45.047	115.221	-	115.221	96.372	100.740	107.350	110.775	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

This Project funds the maturation, integration, and demonstration of advanced technology demonstrators and experimental prototypes to support advanced ground systems; aviation systems; command, control, communication & reconnaissance systems and equipment; precision weapons, High Energy Laser (HEL) systems; and Soldier equipment. Technology Maturation Initiative (TMI) efforts mature and integrate component technologies into early system and sub-system experimental prototypes for demonstration in relevant environments and tactical/operational scenarios, taking technologies to a goal of Technology Readiness Level (TRL) 7. Technology demonstrators and experimental prototypes are validated and transitioned to priority Army experimentation efforts and acquisition programs of record to inform emerging requirements for future systems and reduce the risk of technology insertion. These efforts are typically 2-4 years in duration, and are directed by an Army Senior Executive Steering Group (ESG) based on priority and opportunity, to ensure that demonstrations have high potential for filling capability gaps and transitioning. Activities include the maturation, integration and demonstration of HEL prototype weapons performance on a combat platform in realistic operational environments. A 50 kW-class laser weapon system has the potential to engage and defeat rockets, artillery, mortars (RAM), unmanned aerial vehicles (UAVs), sensors, and optics for maneuvering brigade combat teams (BCTs). Computational Prototyping Environment (CPE) efforts include demonstration of physics-based, computational modeling integrated with new advances in deep learning to explore design tradespaces and understand defeat strategies for prototypic platforms. CPE efforts facilitate rapid, accurate, and computational prototyping in a robust Virtual Proving Ground (VPG) for early performance verification of new capabilities and transition into acquisition programs. This Project provides the Army an improved mechanism for enabling greater competition in the latter stages of technology maturation and establishing a closer alignment between Science and Technology (S&T) efforts and acquisition programs.

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

Work in the Project is performed by the Research, Development and Engineering Command (RDECOM), Engineering Research Development Center (ERDC), the Space and Missile Defense Command/Army Forces Strategic Command (SMDC/ARSTRAT).

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

	FY 2016	FY 2017	FY 2018
Title: Maturation and Prototyping for Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) Systems	19.274	9.187	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>TECHNOLOGY MATURATION INITIATIVES</i>	Project (Number/Name) DS3 / <i>TECHNOLOGY MATURATION INITIATIVES</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Description: This effort selects technologies that show high promise for advancing command, control, communication and reconnaissance capabilities required under acquisition programs; prototypes, evaluates, and demonstrates integrated technologies within a high fidelity and realistic operating environment, and transitions them to a formal program of record at reduced cost and/or risk.</p> <p>FY 2016 Accomplishments: Matured and prototyped Assured Positioning, Navigation and Timing (PNT) devices for mounted and dismounted applications; accelerated the integration and validation of mounted capability with ground vehicle platforms and military Global Positioning System (GPS); continued the development and validation of Anti-Jam GPS Antenna performance specifications and A-Kit to enable off-the-shelf, Assured PNT for mounted applications. Integrated, validated and transitioned mature Improved Forward-Looking Infrared (I-FLIR) prototype solution, addressing program performance requirements at reduced cost and risk prior to Engineering and Manufacturing Development (EMD) phase.</p> <p>FY 2017 Plans: Will complete demonstration and validation of Assured PNT Mounted solutions in support of Assured PNT Program of Record milestone decisions. Will mature Mounted sub-systems for transition and fabrication, and will characterize performance of Assured PNT Mounted solutions both with and without Anti-Jam GPS Antennas.</p>				
<p>Title: Maturation and Prototyping for Ground Systems</p> <p>Description: This effort selects ground maneuver technologies in areas such as mobility, survivability, vehicle architecture, lethality and systems integration, that show high promise for advancing capabilities required under acquisition programs; prototypes, evaluates, and demonstrates integrated technologies within a high fidelity and realistic operating environment, and transitions them to a formal program of record at reduced cost and/or risk. In order to add clarity for the work being conducted in FY17 and beyond, this bullet has been broken into three new bullets: Vehicle Survivability Subsystem Demonstrator, Advanced Powertrain Subsystem Demonstrator, and the Modular Active Protection System (MAPS) Demonstration.</p> <p>FY 2016 Accomplishments: Began multi-year effort to fabricate, integrate, and evaluate critical subsystem prototypes in support of the Combat Vehicle Prototyping (CVP) program, reducing the risk of transitioning next-generation and leap-ahead technologies. Built mature, CVP subsystem prototypes for vehicle blast mitigation, including seat, restraint, hull and floor components; evaluated component prototypes' ability to reduce dynamic deformation, blast loading, and occupant injury against increased blast threats, Began CVP advanced engine and transmission component prototype builds for performance evaluation. Began multi-year effort to mature, demonstrate, and test modular Active Protection System (APS) common architecture, components, and controller that will provide future fighting vehicles with increased protection against current and emerging advanced threats, while maintaining or reducing</p>		13.059	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / TECHNOLOGY MATURATION INITIATIVES	Project (Number/Name) DS3 / TECHNOLOGY MATURATION INITIATIVES		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
vehicle weight. Verified APS common architecture performance and flexibility in soft-kill configurations by integrating and testing interchangeable soft-kill sensors and countermeasures; conducted maturation testing of these components for performance in realistic and operational environments and to ensure their ability to operate across all relevant scenarios; evaluated APS subsystem.				
<p>Title: Vehicle Survivability Subsystem Demonstrator</p> <p>Description: The Vehicle Survivability Subsystem effort will integrate and demonstrate, cost effective, lightweight designs for the optimization of hull, frame, body, cab and armor technologies to achieve survivability systems weight reductions of 10-15% and increased vehicle survivability against advanced and emerging threats. This effort is coordinated with efforts in PE 0603005A.</p> <p>FY 2017 Plans: Will fabricate and integrate of components and subsystems for a survivability subsystem demonstrator targeting tracked combat vehicles with limited ground standoff. Will integrate blast components & subsystems such as; floors, seats, lightweight hull, and active blast mitigation systems into a blast demonstrator for underbody blast and structural evaluation. Will exploit subsystem design optimization conducted in 0603005A to achieve system level performance metrics and improve upon subsystem performance specifications.</p> <p>FY 2018 Plans: Will leverage the data from the previous year testing to integrate lessons learned while fabricating and integrating advanced components and optimized subsystems for a survivability demonstrator, targeting tracked combat vehicles with limited ground standoff. Will integrate matured blast components & subsystems for demonstrator testing, to include: armor, advanced energy absorbing (EA) floors, adjustable EA seats, lighter weight hull with same or better protection levels. Will optimize the number and placement of active blast mitigation system countermeasures into a blast demonstrator for underbody blast and structural evaluation. Will perform design optimization of the survivability demonstrator for Fiscal Year (FY) 2019.</p>		-	10.170	10.271
<p>Title: Advanced Powertrain Subsystem Demonstrator</p> <p>Description: The Advanced Powertrain Subsystem Demonstrator effort will fabricate, integrate and demonstrate next generation, scalable combat vehicle powertrain technologies into a high power dense and more fuel efficient combat vehicle powertrain. This powertrain will demonstrate advancements in engine and transmission subsystem components specific for military platforms in order to provide an integrated advanced propulsion system in a high fidelity and realistic military operating environment. This effort is coordinated with efforts in PE 0603005A.</p> <p>FY 2017 Plans: Will continue integration of powertrain technologies such as advanced multi-cylinder engine, transmission, thermal management, and integrated starter generator into a subsystem powertrain demonstrator. Will begin evaluations of integrated powertrain</p>		-	9.508	12.950

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / TECHNOLOGY MATURATION INITIATIVES	Project (Number/Name) DS3 / TECHNOLOGY MATURATION INITIATIVES		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
subsystems and system level designs in a laboratory environment. Will mature subsystem performance specifications for powertrain technologies such as advanced multi-cylinder engine and thermal management systems. FY 2018 Plans: Will integrate the major subsystem to include the multi-cylinder engine and the advanced high efficient transmission as part of the overall advanced powertrain demonstrator integration. As part of the subsystem integration, will verify and validate a functional opposed piston, multi-cylinder engine operationally mated to a high efficiency cross drive (to include steering and braking) transmission to support military tracked vehicles. The technology will be developed for future military vehicle application such as the Bradley Family of Vehicles and future fighting vehicles.				
Title: Modular Active Protection System (MAPS) Demonstration Description: This effort will conduct APS component and subsystem technology maturation and adaption, aligned with Survivability Sets 1, 2, and 3, as well as Expedited APS activity, to increase component reliability, comply with the Army's modular approach to active protection, and resolve component integration challenges; will integrate subsystem technology demonstrators and conduct demonstrations of soft-kill and hard-kill APS capability to verify APS performance within the modular and safe design approach and to reduce technical risk for APS transition for the current and future combat and tactical vehicle platforms. FY 2017 Plans: Will implement a modular active protection system architecture configuration using sensors and countermeasures that are matured and compliant with the Modular APS Framework interfaces and protocols. Will realize the first prototype of a modular APS through platform integration of a soft-kill APS. Will mature, integrate and test APS at the component and system level; will conduct advanced performance and safety testing of APS sensors and countermeasures to verify durability and reliability in relevant environmental conditions and operating environments prior to system level platform integration into a prototype for testing and demonstration; will characterized performance and evaluate APS interoperability of a soft-kill APS configuration during system-level demonstrations. Will develop soft-kill component performance specifications using the results of the APS component testing completed. Will evaluate APS integration on current Army platforms such as Abrams, Bradley, and Stryker. FY 2018 Plans: Will complete build of soft-kill/hard-kill Modular APS Controller subsystem technology demonstrator and demonstrate in a relevant environment. Will implement Modular APS framework for Survivability Set 1 (SS1) capabilities, including passive threat sensing (i.e., laser warning receiving and passive infrared (IR) cue) and smoke technologies; will mature Modular APS framework for Survivability Set 2 (SS2) soft-kill capabilities, including passive threat sensing, smoke, and countermeasure technologies. Will continue evaluation of APS installation on current Army Abrams, Bradley, and Stryker platforms.		-	16.182	9.000
Title: Maturation and Prototyping for Soldier Systems		0.960	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / TECHNOLOGY MATURATION INITIATIVES	Project (Number/Name) DS3 / TECHNOLOGY MATURATION INITIATIVES		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Description: This effort selects technologies that show high promise for advancing required soldier system capabilities required under acquisition programs; prototypes, evaluates, and demonstrates integrated technologies within a high fidelity and realistic operating environment, and transitions them to a formal program of record at reduced cost and/or risk.</p> <p>FY 2016 Accomplishments: Completed the maturation, demonstration and validation of targeting software for the Mobile Handheld Fires Application; integrated Government Purpose Rights software into full prototype solution and transitioned to the Pocket-sized Forward Entry Device (PFED) Inc 2 Program of Record.</p>				
<p>Title: Maturation and Prototyping for Logistics and Sustainment Systems</p> <p>Description: This effort selects logistics and/or sustainment technologies that show high promise for advancing mobility capabilities required under acquisition programs; prototypes, evaluates, and demonstrates integrated technologies within a high fidelity and realistic operating environment, and transitions them to a formal program of record at reduced cost and/or risk.</p> <p>FY 2016 Accomplishments: Completed the demonstration and validation the advanced Transparent Armor 3a design against Rock Strike requirements; completed integration and testing of the government-own design on Joint Light Tactical Vehicle (JLTV) and transitioned to materiel vendors for increased competition.</p>		1.200	-	-
<p>Title: Multi-Mission High Energy Laser (MMHEL)</p> <p>Description: This effort matures and integrates a 50 kW-class laser system into a Stryker platform, providing a system-level, HEL experimental prototype for demonstration in realistic operating environments. These demonstrations will inform requirements, decrease risk for future Army HEL acquisition programs, and support the future development of warfighter Tactics/Techniques/Procedures (TTPs) and Concept of Operations (CONOPS). HEL weapon systems are expected to complement conventional offensive and defensive weapons at a lower cost-per-shot than current systems and without the need to stockpile ordnance. A 50 kW-class laser weapon system has the potential to engage and defeat rockets, artillery, mortars (RAM); UAVs; sensors; and optics for maneuvering BCTs. Demonstrations will also inform potential future capability to defeat both fixed- and rotary-wing manned aircraft. Leveraging Government investments and Industry technology advancements, will review and select existing HEL subsystem designs for integration into a Stryker vehicle; will conduct integration and demonstration of a system-level HEL experimental prototype; and will provide assessment of technical performance in an operational environment.</p> <p>FY 2018 Plans: Will establish government/industry teams for execution of the MMHEL effort. Leveraging previous advanced technology development and risk-reduction activities, will update and review existing 50kW-class laser subsystem designs and interfaces</p>		-	-	82.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / TECHNOLOGY MATURATION INITIATIVES	Project (Number/Name) DS3 / TECHNOLOGY MATURATION INITIATIVES

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
for integration into a Stryker vehicle (including laser, beam control, power, thermal management, and Army Battle Management Command, Control, and Computers (BMC3) architecture). Will assess and select sub-system designs for utilization in MMHEL and develop overall system-level experimental prototype design. Will develop interface control documents with the Army Battle Management Communications, Command, Control, Computers and Intelligence (BMC4I) network, and refine system architecture accordingly. Will initiate build and integration of system-level experimental prototype hardware.			
Title: Computational Prototyping Environment	-	-	1.000
Description: The Computational Prototyping Environment (CPE) effort will create an integrated, robust, and verified testing and evaluation system that leverages recent Department of Defense advancements in large data tradespace analytics, high-fidelity physics-based modeling, deep learning techniques, high performance computing capabilities, and inverse modeling approaches. The CPE will demonstrate the verification and validation of selected weapons platform variations in a way that accurately identifies potential performance and design failures, while also testing and mitigating solutions and multiple trades in a VPG prior to cost-bearing production and manufacturing. The CPE will reduce the cost and the time required for testing and evaluating air and ground vehicle systems, thereby reducing acquisition risk and enabling rapid transition of new warfighting capabilities.			
FY 2018 Plans: Will develop sustainable integration framework. Will begin build of initial VPG and complete CPE architecture.			
Accomplishments/Planned Programs Subtotals	34.493	45.047	115.221

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• RDT&E,A: RDT&E,A PE 0604120A	30.058	83.279	108.847	-	108.847	87.914	37.847	28.851	-	Continuing	Continuing

Remarks
Program Element Title: Assured Positioning, Navigation and Timing (A-PNT)

D. Acquisition Strategy
Multiple competitive contracts will be awarded based on selection of Technology Maturation Initiative efforts by the Senior Executive Steering Group. These efforts will continue to exercise competitively awarded contracts using best value source selection procedures. The Other Transaction Agreement (OTA) # W15QKN-14-9-1001 Initiative (Task Order) DOTC-16-01-INIT-0302 will be the primary contract vehicle for the MMHEL effort. Computational Prototyping Environment activities will be conducted both in-house and through competitively awarded contracts using best value source selection procedures.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>TECHNOLOGY MATURATION INITIATIVES</i>	Project (Number/Name) DS3 / <i>TECHNOLOGY MATURATION INITIATIVES</i>

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / TECHNOLOGY MATURATION INITIATIVES	Project (Number/Name) DS3 / TECHNOLOGY MATURATION INITIATIVES
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Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Maturation and Prototyping for C4ISR Systems	C/Variou	Various : Various	0.000	19.274		9.187		-		-		-	0.000	28.461	0.000
Maturation and Prototyping for Ground Systems	C/Variou	Various : Various	0.000	13.059		-		-		-		-	0.000	13.059	0.000
Vehicle Survivability Subsystem Demonstrator	C/Variou	Various : Various	0.000	-		10.170		10.271		-		10.271	0.000	20.441	0.000
Advanced Powertrain Subsystem Demonstrator	C/Variou	Various : Various	0.000	-		9.508		12.950		-		12.950	0.000	22.458	0.000
Modular Active Protection Systems (MAPS) Demonstrations	C/Variou	Various : Various	0.000	-		16.182		9.000		-		9.000	0.000	25.182	0.000
Maturation and Prototyping for Soldier Systems	C/Variou	Various : Various	0.000	0.960		-		-		-		-	0.000	0.960	0.000
Maturation and Prototyping for Logistics and Sustainment Systems	C/Variou	Various : Various	0.000	1.200		-		-		-		-	0.000	1.200	0.000
Multi-Mission High Energy Laser (MMHEL)	C/Variou	Various : Huntsville, AL	0.000	-		-		82.000		-		82.000	153.000	235.000	0.000
Computational Prototyping Environment	C/Variou	Various : Various	0.000	-		-		1.000		-		1.000	0.000	1.000	0.000
Subtotal			0.000	34.493		45.047		115.221		-		115.221	153.000	347.761	0.000

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	34.493	45.047	115.221	-	115.221	153.000	347.761	0.000

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>TECHNOLOGY MATURATION INITIATIVES</i>	Project (Number/Name) DS3 / <i>TECHNOLOGY MATURATION INITIATIVES</i>
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Maturation and Prototyping for C4ISR Systems																												
Maturation and Prototyping for Ground Systems																												
Vehicle Survivability Subsystem Demonstrator																												
Advanced Powertrain Subsystem Demonstrator																												
Modular Active Protection Systems (MAPS) Demonstrations																												
Maturation and Prototyping for Soldier Systems																												
Maturation and Prototyping for Logistics and Sustainment Systems																												
Multi-Mission High Energy Laser (MMHEL) - System-Level Design																												
MMHEL - Subsystem Design Refinement, Assembly, and Delivery																												
MMHEL - Firing Doctrine and Experimental Prototype System Software																												
MMHEL - Experimental Prototype System Integration and Checkout																												
MMHEL - Experimental Prototype System Demonstration and Assess																												
Computational Prototyping Environment																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>TECHNOLOGY MATURATION INITIATIVES</i>	Project (Number/Name) DS3 / <i>TECHNOLOGY MATURATION INITIATIVES</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Maturation and Prototyping for C4ISR Systems	3	2014	4	2017
Maturation and Prototyping for Ground Systems	3	2014	4	2016
Vehicle Survivability Subsystem Demonstrator	1	2017	4	2019
Advanced Powertrain Subsystem Demonstrator	1	2017	4	2019
Modular Active Protection Systems (MAPS) Demonstrations	1	2017	4	2018
Maturation and Prototyping for Soldier Systems	1	2015	4	2016
Maturation and Prototyping for Logistics and Sustainment Systems	1	2015	4	2016
Multi-Mission High Energy Laser (MMHEL) - System-Level Design	1	2018	3	2018
MMHEL - Subsystem Design Refinement, Assembly, and Delivery	4	2018	4	2019
MMHEL - Firing Doctrine and Experimental Prototype System Software	1	2019	3	2021
MMHEL - Experimental Prototype System Integration and Checkout	2	2019	4	2020
MMHEL - Experimental Prototype System Demonstration and Assess	4	2020	4	2021
Computational Prototyping Environment	1	2019	4	2022

Note

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604115A / <i>TECHNOLOGY MATURATION INITIATIVES</i>				Project (Number/Name) EX3 / <i>Ground Vehicle Prototyping</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EX3: <i>Ground Vehicle Prototyping</i>	-	0.000	25.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	25.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is a new start.

A. Mission Description and Budget Item Justification

This Project funds the prototyping and demonstration of ground vehicle technologies. The main goals are to conduct technical assessments against selected capability trades and future technologies for current and future combat vehicles across the combat vehicle portfolio. The funding will support continuing advanced concept development, trade studies, technology maturation/testing, technical/operational/affordability analyses, and system and subsystem iterative and integrated prototyping to assess future designs that integrate emerging science and technology advancements for current and future combat vehicles and to inform the Army's Force 2025 Maneuvers campaign of learning.

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

This work is fully coordinated with and complementary to Program Element (PE) 0603005A (Combat Vehicle and Automotive Advanced Technology), and PE 0603645/ EV7 (Armored Systems Modernization Advance Development/Combat Vehicle Prototyping). Work in the Project is performed by the Research, Development and Engineering Command (RDECOM).

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

	FY 2016	FY 2017	FY 2018
Title: Ground Vehicle Prototyping	-	25.000	-
Description: This effort conducts system level ground vehicle advanced concepting, prototyping and demonstration. This effort will partner Government and industry for an iterative and integrated combat vehicle concepting and prototyping process to inform future vehicle Requirements, inform current and future vehicle performance characteristics, reduce future acquisition risk, and evaluate and update Operational Concepts. Activity will include the integration and demonstration of a series of subsystem demonstrators building off of previous investment in ground combat acquisition and science and technology programs.			
FY 2017 Plans: Will conduct concept development and system level risk reduction for current and next generation combat vehicles. Will mature system level concepts and prototype designs to integrate advanced ground vehicle subsystem technologies such as active protection systems, armor, powertrains, lethality solutions, and electronics architectures. Will partner Government and industry			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604115A / <i>TECHNOLOGY MATURATION INITIATIVES</i>	Project (Number/Name) EX3 / <i>Ground Vehicle Prototyping</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
through the design and vehicle trade process by creating an open collaboration forum for an iterative and integrated prototyping process that seeks the best of breed across the private and public sectors.			
Accomplishments/Planned Programs Subtotals	-	25.000	-

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

N/A

Remarks

D. Acquisition Strategy

Competitive contracts will be awarded. This project will continue to exercise competitively awarded contracts using best value source selection procedures.

E. Performance Metrics

N/A

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604117A / Short Range Air Defense (M-SHORAD)
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	20.000	-	20.000	0.000	0.000	0.000	0.000	Continuing	Continuing
FI4: Short Range Air Defense (M-SHORAD)	-	0.000	0.000	20.000	-	20.000	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

The efforts in this PE are a continuation of the SHORAD “shoot off” in Fourth Quarter FY 2017, which was requested in Program Element 0203801, Project DT5. The “shoot off” will evaluate industry solutions for mitigating the maneuver SHORAD capability gap.

A. Mission Description and Budget Item Justification

The Army has a need to improve capabilities to defend maneuver formations and other tactical echelons from low altitude air attack and surveillance. Adaptive threats have developed a suite of airborne threat capabilities, supported by an integrated mix of surface-to-air and surface-to-surface shooters that threaten maneuver forces’ ability to conduct operations. Specifically, maneuver formations require improved air defense identification and defeat capabilities to counter Rocket Artillery and Mortar (RAM), Fixed Wing (FW), Rotary Wing (RW), and Unmanned Aerial Systems (UAS)).

This additional capability will be provided through a multi-phase approach that enables rapid fielding of an initial capability, culminating in a program of record that will field a full capability. Initially, the Army will field an interim, near-term Maneuver-Short Range Air Defense (M-SHORAD) solution using an Army Senior Leader Directed Requirement, informed by a FY 2017 “SHORAD Shoot Off”. The system or system-of-systems solution will provide the capability to identify, track, and neutralize or destroy low-altitude air threats to include Rotary Wing (RW), Group 1 – 3 Unmanned Aircraft Systems (UAS), and Fixed Wing (FW) while keeping pace and surviving with the armored and infantry maneuver forces. This interim solution will be fielded to one M-SHORAD battalion.

The FY 2018 will begin the initial interim M-SHORAD capability development and integration of the identified solution into existing maneuver formation equipment. The interim solution requirements will be identified in an Army Senior Leader Directed Requirement and based on the FY 2017 “SHORAD Shoot Off”. Efforts will include: hardware/software modifications and integration of sensors and defeat mechanisms; initial development of tactics, techniques, and procedures (TTPs); initial development of logistics products to include training requirements; and planning for testing required to obtain a material release.

FY2018 base dollars in the amount of \$20,000 million are required to support the analysis and design, integration, and testing of the M-SHORAD solutions.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604117A / <i>Short Range Air Defense (M-SHORAD)</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	20.000	-	20.000
Total Adjustments	0.000	0.000	20.000	-	20.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	20.000	-	20.000

Change Summary Explanation

Additional funding is to begin interim M-SHORAD development efforts, leveraging the FY17 M-SHORAD Shoot off.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604117A / <i>Short Range Air Defense (M-SHORAD)</i>				Project (Number/Name) F14 / <i>Short Range Air Defense (M-SHORAD)</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
F14: <i>Short Range Air Defense (M-SHORAD)</i>	-	0.000	0.000	20.000	-	20.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is a New Start.

A. Mission Description and Budget Item Justification

The Army has a need to improve capabilities to defend maneuver formations and other tactical echelons from low altitude air attack and surveillance. Adaptive threats have developed a suite of airborne threat capabilities, supported by an integrated mix of surface-to-air and surface-to-surface shooters that threaten maneuver forces' ability to conduct operations. Specifically, maneuver formations require improved air defense identification and defeat capabilities to counter Rocket Artillery and Mortar (RAM), Fixed Wing (FW), Rotary Wing (RW), and Unmanned Aerial Systems (UAS)).

This additional capability will be provided through a multi-phase approach that enables rapid fielding of an initial capability, culminating in a program of record that will field a full capability. Initially, the Army will field an interim, near-term Maneuver-Short Range Air Defense (M-SHORAD) solution using an Army Senior Leader Directed Requirement, informed by a FY 2017 "SHORAD Shoot Off". The system or system-of-systems solution will provide the capability to identify, track, and neutralize or destroy low-altitude air threats to include Rotary Wing (RW), Group 1 – 3 Unmanned Aircraft Systems (UAS), and Fixed Wing (FW) while keeping pace and surviving with the armored and infantry maneuver forces. This interim solution will be fielded to one M-SHORAD battalion.

The FY 2018 will begin the initial interim M-SHORAD capability development and integration of the identified solution into existing maneuver formation equipment. The interim solution requirements will be identified in an Army Senior Leader Directed Requirement and based on the FY 2017 "SHORAD Shoot Off". Efforts will include: hardware/software modifications and integration of sensors and defeat mechanisms; initial development of tactics, techniques, and procedures (TTPs); initial development of logistics products to include training requirements; and planning for testing required to obtain a material release.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Interim Solution Material Development/Integration	-	-	15.000	-	15.000
Description: Funding is provided for the following efforts:					
FY 2018 Base Plans:					
- Leverage information gathered during the SHORAD "Shoot Off" to begin hardware/software modifications and integration of sensors and defeat mechanisms based on the Directed Requirement.					
- Begin purchasing components and/or manufacturing of prototype hardware for the interim solution.					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / <i>Short Range Air Defense (M-SHORAD)</i>	Project (Number/Name) F14 / <i>Short Range Air Defense (M-SHORAD)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
- Assess the interim solution to begin shaping requirements for the longer-term solution.					
Title: Logistics and Test Planning	-	-	5.000	-	5.000
Description: Funding is provided for the following efforts:					
FY 2018 Base Plans:					
- Begin initial development of logistics products to include training requirements, an assessment of changes to school, unit collective training, and potentially training devices.					
- Begin initial TTP efforts to conduct Air and Missile Defense operations in support of the maneuvering force.					
- Leverage the SHORAD Shoot Off testing to begin test planning supporting material release requirements.					
Accomplishments/Planned Programs Subtotals	-	-	20.000	-	20.000

C. Other Program Funding Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PE 0605456A Proj PA3: <i>PAC-3/MSE MISSILE</i>	2.201	-	-	-	-	-	-	-	-	0	2.201
• SSN C53101: <i>MSE Missile</i>	514.946	702.201	459.040	-	459.040	499.915	540.669	523.413	524.934	Continuing	Continuing
• PE 0205456A Proj EF9: <i>System Integration and Test</i>	61.653	73.417	78.926	-	78.926	80.314	109.222	112.614	123.007	Continuing	Continuing
• PE 0604114A Proj EX2: <i>Lower Tier Air Missile Defense (LTAMD) Capability</i>	-	35.132	76.728	-	76.728	67.088	83.195	141.185	142.000	Continuing	Continuing
• SSN C50016: <i>Lower Tier Air and Missile Defense (AMD)</i>	130.275	126.470	140.826	-	140.826	125.161	144.243	119.282	121.825	Continuing	Continuing
• PE 0604319A Proj DU: <i>IFPC2</i>	149.222	-	11.303	-	11.303	52.604	239.305	259.804	316.104	Continuing	Continuing
• PE 0605052A Proj EY7: <i>IFPC Increment 2 - Block 1</i>	-	83.995	175.069	-	175.069	149.506	52.300	24.700	-	0.000	485.570
• SSN C62001: <i>IFPC Inc 2-I Block 1 Missile 1</i>	-	-	57.742	-	57.742	157.406	144.740	100.400	14.600	Continuing	Continuing
• SSN C62002: <i>IFPC Inc 2-I Block 1 System</i>	-	19.319	-	-	-	31.641	191.830	315.025	277.500	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / <i>Short Range Air Defense (M-SHORAD)</i>	Project (Number/Name) F14 / <i>Short Range Air Defense (M-SHORAD)</i>
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• SSN C62004: <i>IFPC Inc 2-I Block 2 Missile</i>	-	-	-	-	-	-	-	-	12.300	Continuing	Continuing
• PE 0604820A Proj E10: <i>Sentinel</i>	11.821	15.983	32.968	-	32.968	31.761	51.897	72.562	81.351	Continuing	Continuing
• PE 0605457A Proj S40: <i>Army Integrated Air and Missile Defense (AIAMD)</i>	222.074	272.811	336.420	-	336.420	290.250	190.600	117.470	64.510	Continuing	Continuing
• SSN BZ5075: <i>IAMD Battle Command System</i>	20.917	204.969	-	-	-	-	274.494	375.026	513.464	Continuing	Continuing
• PE 0604741A Proj 146: <i>Air Defense C2I Eng Dev</i>	33.619	61.532	28.726	-	28.726	28.320	14.638	8.674	-	0	175.509
• SSN AD50700: <i>AIR & MSL Defense Planning & Control Sys</i>	28.176	126.539	26.635	24.100	50.735	17.960	6.366	32.397	-	0	262.173

Remarks

This program is an integral part of the Army Integrated Air and Missile Defense (IAMD) architecture.

D. Acquisition Strategy

Multi-phase approach using the SHORAD “Shoot off” as the initial basis to identify near-term interim solutions. The acquisition strategy for this near-term interim solution will be driven by identification of the solution that best addresses the capability gaps in a short timeframe and the content of the directed requirement. Given the urgency of the requirement, existing contracts will be leveraged to the maximum extent possible.

The Army continues to develop the strategy for the longer-term program of record solution and will request follow-on resources based on emerging plans. The longer-term process to a program of record may involve additional near-to-mid-term interim solutions using maturing technology prior to the program of record development. Outyear resources will be applied as the solutions are more fully identified and cost estimates are refined.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / Short Range Air Defense (M-SHORAD)	Project (Number/Name) F14 / Short Range Air Defense (M-SHORAD)
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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	TBD	Cruise Missile Defense Systems Project Office : Huntsville, Alabama	0.000	-		-		1.000	Oct 2017	-		1.000	Continuing	Continuing	Continuing
Subtotal			0.000	-		-		1.000		-		1.000	-	-	-

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System/Sub-system Development Engineering	Various	Multiple Activities : Multiple Locations	0.000	-		-		12.000		-		12.000	0.000	12.000	0.000
System/Sub-system Prototype Manufacturing	TBD	To Be Determined : To Be Determined	0.000	-		-		2.000		-		2.000	0.000	2.000	0.000
Subtotal			0.000	-		-		14.000		-		14.000	0.000	14.000	0.000

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System/Subsystem Developmental Testing	Various	Multiple Activities : Multiple Locations	0.000	-		-		5.000		-		5.000	0.000	5.000	0.000
Subtotal			0.000	-		-		5.000		-		5.000	0.000	5.000	0.000


			Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	-		0.000		20.000		-		20.000	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / <i>Short Range Air Defense (M-SHORAD)</i>	Project (Number/Name) F14 / <i>Short Range Air Defense (M-SHORAD)</i>
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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) Directed Requirement									 Directed Requirement																			
Interim Solution Material Development/Integration									Interim Solution Material Development/Integration																			

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604117A / <i>Short Range Air Defense (M-SHORAD)</i>	Project (Number/Name) F14 / <i>Short Range Air Defense (M-SHORAD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Directed Requirement	1	2018	1	2018
Interim Solution Material Development/Integration	2	2018	1	2019

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604118A / <i>TRACTOR BEAM</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	10.400	-	10.400	10.000	0.000	0.000	0.000	0.000	20.400
XW0: <i>TRACTOR BEAM</i>	-	0.000	0.000	10.400	-	10.400	10.000	0.000	0.000	0.000	0.000	20.400

A. Mission Description and Budget Item Justification

The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	10.400	-	10.400
Total Adjustments	0.000	0.000	10.400	-	10.400
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	10.400	-	10.400

Change Summary Explanation

Fiscal Year 2019 - Classified Program funds increase.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	26.967	83.279	164.967	-	164.967	138.323	80.491	25.811	1.673	Continuing	Continuing
ED5: Assured Positioning, Navigation and Timing (PNT)	-	7.416	11.116	23.991	-	23.991	20.000	28.000	12.010	0.000	0.000	102.533
EH8: DISMOUNTED	-	0.000	3.200	14.423	-	14.423	10.507	2.263	0.000	0.000	0.000	30.393
EH9: PSEUDOLITES	-	19.551	57.411	79.230	-	79.230	44.768	8.407	0.000	0.000	0.000	209.367
EJ2: MOUNTED	-	0.000	11.552	35.300	-	35.300	44.273	11.828	5.655	0.000	0.000	108.608
EJ3: ANTI-JAM ANTENNA	-	0.000	0.000	12.023	-	12.023	18.775	29.993	8.146	1.673	Continuing	Continuing

Note

PE 0604120A: Assured Positioning, Navigation and Timing will transition from Budget Activity-4 to Budget Activity-5 in Fiscal Year 2020.

A. Mission Description and Budget Item Justification

Assured Positioning, Navigation and Timing (PNT) will provide the Army's ground maneuver forces access to trusted PNT information under conditions where space-based PNT Global Positioning System (GPS) may be limited or denied. Joint Requirements Oversight Council Memo (JROCM) 049-10, dated 05 Apr 2010, approved the Positioning, Navigation and Timing Assurance Initial Capabilities Document and designated the Army as the Lead Component for Assured PNT. The Material Development Decision (MDD) was approved on 30 Jul 2013. The Assured PNT draft Capabilities Development Document was validated by the Army Requirements Oversight Council (AROC) on 28 Jul 2014.

PNT is a critical enabler of many Army systems. The current GPS capability is a fixed frequency system vulnerable to current and emerging threats and field conditions, which means Warfighter assured access and integrity to PNT is not guaranteed. This situation degrades mission performance to an unacceptable level. Therefore, current Army systems cannot operate at the required PNT Assurance Levels with GPS alone.

Assured PNT is a system of systems consisting of one project (ED5) Assured PNT and four separate and interdependent PNT products; (EH8) Dismounted A-PNT System, (EH9) Pseudolite, (EJ2) Mounted A-PNT System, and (EJ3) Anti-Jam Antenna System (AJAS). These interdependent PNT products assure access to and integrity of PNT information. Each system provides a degree of standalone capability, but only when deployed together can Assured PNT be achieved in all environments and across all formations and warfighting functions. Program Manager (PM) PNT manages these four products (Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and AJAS) constructed to develop, test, field, and sustain the A-PNT materiel solution. The final contracting strategy is under development.

Assured PNT consists of:

(ED5) - The Assured PNT funding line originally represented the entire program prior to breaking into four funding lines. The FY17-FY22 funding now includes PNT System of Systems Architecture (SOSA) Testing and Resiliency and Software Assurance Modification (RSAM) to legacy GPS systems.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>
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(EH8) - The Dismounted Assured Positioning, Navigation and Timing (PNT) System is a Size, Weight, Power, and Cost (SWAP-C) optimized military Global Positioning System (GPS) and non-GPS sensor suite that acquires and distributes trusted PNT data to soldier-borne systems.

(EH9) - The Pseudolite system provides area protection and PNT Assurance in GPS denied environments by providing terrestrial radio navigation (GPS-like) service in electronically or physically challenged environments using a higher power signal.

(EJ2) - The Mounted Assured PNT System fuses military GPS with physics based sensors and timing technology to acquire and distribute secure trusted PNT data to tactical client systems on vehicular and watercraft platforms.

(EJ3) - The Anti-Jam Antenna Systems (AJAS) provides GPS signal point protection and PNT Assurance in challenged environments through anti-jam technologies. AJAS enables tactical capabilities through assured signal acquisition in challenged environments.

FY 2018 Base funds in the total amount of \$164.967 million are provided to continue the development of the Assured PNT program. The ED5 funding line accounts for \$23.991 million for PNT System of Systems Architecture (SOSA) Testing, Resiliency and Software Assurance Modification (RSAM) and enhancements of Army PNT capabilities. The EH8 funding line accounts for \$14.423 million to support risk reduction efforts for the Dismounted A-PNT System. The EH9 funding line accounts for \$79.230 million for the continuation of the Technology Maturation and Risk Reduction phase for Pseudolite. The EJ2 funding line accounts for \$35.300 million to support risk reduction efforts for the Mounted Assured PNT System. The EJ3 funding line accounts for \$12.023 million to support risk reduction efforts for the AJAS.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	30.058	83.279	108.847	-	108.847
Current President's Budget	26.967	83.279	164.967	-	164.967
Total Adjustments	-3.091	0.000	56.120	-	56.120
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.191	-			
• Adjustments to Budget Years	0.000	0.000	56.120	-	56.120
• Other Adjustments 1	-1.900	0.000	0.000	-	0.000

Change Summary Explanation

FY 2016 reduction of \$1.900 million reflects realignment of funding to higher priority requirement for Anti-Personnel Landmine Alternatives.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	
<p>FY 2018 Base funds increased by \$56.120 million in order to support the continuation of the Pseudolites Technology Maturation and Risk Reduction (TMRR) phase. In addition, the funding supports the risk reduction efforts for all four Assured PNT products (Dismounted A-PNT System, Pseudolite, Mounted A-PNT System and Anti-Jam Antenna).</p>		

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
ED5: Assured Positioning, Navigation and Timing (PNT)	-	7.416	11.116	23.991	-	23.991	20.000	28.000	12.010	0.000	0.000	102.533
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

PE 0604120A: ED5 - Assured Positioning, Navigation and Timing is transitioning from Budget Activity-4 to Budget Activity-5 in Fiscal Year 2019.

A. Mission Description and Budget Item Justification

Assured PNT will provide the Army's ground maneuver forces access to trusted PNT information under conditions where space-based PNT Global Positioning System (GPS) may be limited or denied. Joint Requirements Oversight Council Memo (JROCM) 049-10, dated 5 Apr 2010, approved the Positioning, Navigation and Timing Assurance Initial Capabilities Document and designated the Army as the Lead Component for Assured PNT. The Material Development Decision (MDD) was approved on 30 Jul 2013. The Assured PNT draft Capabilities Development Document was validated by Army Requirements Oversight Council (AROC) on 28 Jul 2014.

FY 2018 Base funds in the amount of \$23.991 million are to support PNT System of Systems Architecture (SOSA) Testing and Resiliency and Software Assurance Modification (RSAM). The U.S. Army is required to operate in an ever evolving GPS contested environment. The PNT SOSA Testing will allow for Army systems to test developed RSAM software and enable actions to be taken to ensure full operation of Army Forces through RSAM field patches, Military-Code (M-Code) implementation, and Assured PNT.

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

	FY 2016	FY 2017	FY 2018
Title: Military GPS User Equipment for Precision Munitions, PNT System of System Testing and Resiliency and Software Assurance Modification	7.416	11.116	23.991
Description: Acceleration of MGUE (Military GPS User Equipment) Increment 2 for Precision Guided Munitions (AM2P). In addition, the effort supports testing of PNT SOSA of Army PNT capabilities and RSAM.			
FY 2016 Accomplishments: FY 2016 Base funds further assessed the technology maturity and Joint Common GPS Specification and Interface Control Document. These efforts include bench top component level testing of GPS receiver prototypes, integration of the GPS receivers into a Precision Guided Munition platform and live fire guide-to-hit (Technology Readiness Level 6) demonstration of the GPS receivers.			
FY 2017 Plans: FY 2017 Base funds will provide for Army Global Positioning System (GPS)/Positioning, Navigation and Timing (PNT) test assets. These systems and assets will be utilized for System of Systems Architecture (SOSA) testing. The testing data will validate			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) ED5 / <i>Assured Positioning, Navigation and Timing (PNT)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
Resiliency and Software Assurance Modification (RSAM) and aid senior leadership in determining the most equitable path forward on PNT modernization. FY 2018 Plans: FY18 Base funds will support testing of PNT SOSA of Army PNT capabilities. This testing will inform the RSAM and Assured PNT requirements, and will validate RSAM implementation. RSAM implementation will include modifications to Army Legacy receivers GPS systems.				
Accomplishments/Planned Programs Subtotals		7.416	11.116	23.991
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy FY16: The acquisition strategy includes the acceleration of Military GPS User Equipment (MGUE) Increment 2 for Precision Guided Munitions (AM2P). This will provide a technology maturity assessment of MGUE Increment 1 technology and increase supply chain competition for subsequent use by Joint Precision Guided Munitions (PGM) to avoid potential significant performance and operation risks. The Joint Common GPS Specification and Interface Control Document will be validated through live fire Technology Readiness Level 6 (TRL6) demonstration. The M-Code GPS enables essential PGM-based lethality capabilities in potential "M-Code Only" GPS combat scenarios and maintains combat overmatch enabled by Joint GPS-based PGMs. FY17 and beyond: The planned acquisition strategy for PNT SOSA testing and RSAM implementation is to award sole source contracts to the original equipment manufacturers, utilize existing engineering support contracts, and leverage the Communications Electronics Research Development Engineering Center (CERDEC) to develop and evaluate solutions to enhance the resiliency of GPS-dependent systems operating in evolving contested environments.				
E. Performance Metrics N/A				

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)
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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Project Management Support	Allot	PM PNT : Various	0.485	-		0.517	Oct 2017	0.693	Oct 2017	-		0.693	Continuing	Continuing	0.000
Subtotal			0.485	-		0.517		0.693		-		0.693	-	-	0.000

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
AM2P – DOTC GPS Receiver Prototypes	C/FFP	Rockwell Collins : Cedar Rapids, IA	0.630	-		-		-		-		-	0.000	0.630	0.000
AM2P – DOTC GPS Receiver Prototypes	C/CPFF	L-3 IEC : Anaheim, CA	0.600	-		-		-		-		-	0.000	0.600	0.000
AM2P – DOTC GPS Receiver Prototypes	C/CPFF	EOIR Technologies : Fredericksburg, VA	3.982	-		-		-		-		-	0.000	3.982	0.000
AM2P – DOTC GPS Receiver Prototypes	C/CPFF	SAVIT : Rockaway, NJ	0.286	-		-		-		-		-	0.000	0.286	0.000
AM2P – GPS/PGM Integration	MIPR	various : various	0.000	2.989	Jan 2016	-		-		-		-	0.000	2.989	0.000
Develop Pseudolite Competitive Prototype Contractor 1	C/CPIF	Datapath - Rockwell Collins : Cedar Rapids, IA	3.615	-		-		-		-		-	0.000	3.615	0.000
Develop Pseudolite Competitive Prototype Contractor 2	C/CPIF	L-3 Communications : Anaheim, CA	3.237	-		-		-		-		-	0.000	3.237	0.000
RSAM - Develop RSAM Receiver 1 Modifications	SS/CPFF	Rockwell Collins : Cedar Rapids, IA	0.000	-		-		3.035	Feb 2018	-		3.035	Continuing	Continuing	0.000
RSAM - Develop RSAM Receiver 2 Modifications	SS/CPFF	GCC Technologies : Oakland, MD	0.000	-		-		5.892	Jan 2018	-		5.892	Continuing	Continuing	0.000
RSAM - Develop RSAM Integration Modifications	Various	Various : Various	0.000	-		-		1.890	Dec 2017	-		1.890	Continuing	Continuing	0.000
Subtotal			12.350	2.989		-		10.817		-		10.817	-	-	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)
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Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Engineering and Technical Contracting Services	C/FFP	Various : Various	0.920	-		-		4.262	Dec 2017	-		4.262	Continuing	Continuing	0.000
Engineering and Technical Government Services	MIPR	C4ISR : Various	1.290	-		-		1.296	Nov 2017	-		1.296	Continuing	Continuing	0.000
AM2P – Government Eng	MIPR	ARDEC : Picatinny, NJ	1.876	2.120	Jan 2016	-		-		-		-	0.000	3.996	0.000
AM2P- Joint PGM SME	MIPR	Various : Various	2.026	1.415	Jan 2016	-		-		-		-	0.000	3.441	0.000
Subtotal			6.112	3.535		-		5.558		-		5.558	-	-	0.000

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
AM2P – Bench Top Component Level Test	MIPR	Various : Various	0.000	0.112	Mar 2016	-		-		-		-	0.000	0.112	0.000
AM2P – Flight Tests	MIPR	Various : Yuma Proving Ground, AZ	0.000	0.780	Jun 2016	-		-		-		-	0.000	0.780	0.000
SOSA Testing/RSAM - Government Eng Support	MIPR	Various : Various	0.000	-		3.038	Nov 2016	3.660	Nov 2017	-		3.660	Continuing	Continuing	0.000
SOSA Testing/RSAM - Contractor Eng Support	Various	Various : Various	0.000	-		3.800	Dec 2016	1.998	Dec 2017	-		1.998	Continuing	Continuing	0.000
SOSA Testing/RSAM - Receiver acquisition	Various	Various : Various	0.000	-		1.211	Dec 2016	-		-		-	0.000	1.211	0.000
SOSA Testing/RSAM - Test PNT system modifications	Various	Various : Various	0.000	-		2.550	Dec 2016	-		-		-	0.000	2.550	0.000
SOSA Testing/RSAM Test Equipment	Various	Various : Various	0.000	-		-		1.265	Dec 2017	-		1.265	Continuing	Continuing	0.000
Subtotal			0.000	0.892		10.599		6.923		-		6.923	-	-	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army										Date: May 2017			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)					
	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	18.947	7.416		11.116		23.991		-		23.991	-	-	0.000

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) ED5 / Assured Positioning, Navigation and Timing (PNT)
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
AM2P Technology Maturation and Demonstration	AM2P Tech Maturation and Demo																											
AM2P Platform Integration	AM2P Platform Integration																											
AM2P Bench Top Component Testing	AM2P Bench Testing																											
AM2P Flight Testing	AM2P Flight Testing																											
PNT System of Systems Architecture (SOSA) Testing													SOSA Testing															
Resiliency and Software Assurance Modification (RSAM)													RSAM															

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) ED5 / <i>Assured Positioning, Navigation and Timing (PNT)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AM2P Technology Maturation and Demonstration	1	2015	2	2017
AM2P Platform Integration	1	2016	4	2016
AM2P Bench Top Component Testing	3	2016	4	2016
AM2P Flight Testing	4	2016	2	2017
PNT System of Systems Architecture (SOSA) Testing	1	2017	4	2021
Resiliency and Software Assurance Modification (RSAM)	1	2017	4	2021

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EH8 / DISMOUNTED
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EH8: DISMOUNTED	-	0.000	3.200	14.423	-	14.423	10.507	2.263	0.000	0.000	0.000	30.393
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

PE 0604120A: EH8 - Dismounted Assured Positioning, Navigation and Timing (PNT) System will transition from Budget Activity-4 to Budget Activity-5 in Fiscal Year 2020.

A. Mission Description and Budget Item Justification

The Dismounted Assured PNT System acquires, protects, and distributes secure PNT on dismounted platforms. Dismounted A-PNT System is a stand-alone system and will be used in conjunction with the PEO Soldier Nett Warrior System. Dismounted A-PNT System is planned to be modular, scalable form-factor that paces the threats and includes development and integration of GPS and non-GPS sensors. Dismounted A-PNT System includes receiver software capable of acquiring Pseudolite signals resulting in additional protection for military GPS in denied environments and includes a migration path to Military-Code (M-Code) and other future technologies.

FY 2018 Base funds in the amount of \$14.423 million are provided to support risk reduction/prototyping efforts required to mature critical technologies and development of the Acquisition Requirements Package and other documentation to support the Developmental Request for Proposal Release Decision Point milestone.

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

	FY 2016	FY 2017	FY 2018
Title: Dismounted A-PNT System	-	3.200	14.423
Description: Risk Reduction efforts to reduce technology risk and to determine the appropriate set of technologies to be integrated into the full system.			
FY 2017 Plans: FY 2017 Base funds will support risk reduction efforts for the Dismounted A-PNT System.			
FY 2018 Plans: FY2018 Base funds will support risk reduction/prototyping efforts required to mature critical technologies and development of the Acquisition Requirements Package and other documentation to support the Developmental Request for Proposal Release Decision Point milestone.			
Accomplishments/Planned Programs Subtotals	-	3.200	14.423

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

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH8 / <i>DISMOUNTED</i>

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

Remarks

D. Acquisition Strategy

Assured Positioning, Navigation and Timing (PNT) is a system comprised of four products; Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and Anti-Jam Antenna System (AJAS), to assure access to and integrity of PNT information. Each product provides a degree of standalone capability, but only when deployed together can Assured PNT be achieved in all environments and across all formations and warfighting functions. Program Manager (PM) PNT manages these four products (Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and AJAS) constructed to develop, test, field, and sustain the A-PNT materiel solution. The final contracting strategy is under development.

The Dismounted A-PNT System acquisition strategy will begin at Milestone B. After successful Milestone B and award of the Engineering Manufacturing Development contract, development, integration and testing of the Dismounted A-PNT System solution will begin.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EH8 / DISMOUNTED
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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Project Management Support - Government	Allot	PM PNT : APG, MD	0.000	-		0.425	Oct 2016	0.558	Oct 2017	-		0.558	Continuing	Continuing	0.000
Project Management Support - Contractor	C/CPFF	Various : Various	0.000	-		-		0.186	Nov 2017	-		0.186	Continuing	Continuing	0.000
FFRDC	SS/CR	MITRE : Various	0.000	-		0.290		-		-		-	0.000	0.290	0.000
Subtotal			0.000	-		0.715		0.744		-		0.744	-	-	0.000

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Development of a Dismounted M-Code capable prototype	MIPR	PEO Command Control Communications-Tactical : APG, MD	0.000	-		-		5.200	Dec 2017	-		5.200	Continuing	Continuing	0.000
Development of a small SWAP-C multi sensor navigation prototype	MIPR	CERDEC Command Power and Integration Directorate : APG, MD	0.000	-		-		4.694	Dec 2017	-		4.694	Continuing	Continuing	0.000
Development of sensor fusion algorithm	MIPR	CERDEC Command Power and Integration Directorate : APG, MD	0.000	-		-		0.789	Dec 2017	-		0.789	Continuing	Continuing	0.000
Engineering and Technical Product Support	MIPR	C4ISR : Various	0.000	-		-		0.412	Nov 2017	-		0.412	Continuing	Continuing	0.000
Subtotal			0.000	-		-		11.095		-		11.095	-	-	0.000

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH8 / <i>DISMOUNTED</i>
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Dismounted A-PNT Risk Reduction Activities													Risk Reduction Activities															
(1) A-PNT Developmental RFP Release Decision													Developmental RFP Release Decision															
(2) Dismounted A-PNT Milestone B Decision													Milestone B Decision															
Dismounted A-PNT Engineering Manufacturing Development (EMD)																												
Dismounted A-PNT Developmental Testing																					Developmental Testing							
(3) Dismounted A-PNT Milestone C Decision																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH8 / <i>DISMOUNTED</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Dismounted A-PNT Risk Reduction Activities	1	2017	3	2019
A-PNT Developmental RFP Release Decision	3	2018	3	2018
Dismounted A-PNT Milestone B Decision	3	2019	3	2019
Dismounted A-PNT Engineering Manufacturing Development (EMD)	3	2019	3	2021
Dismounted A-PNT Developmental Testing	4	2020	2	2021
Dismounted A-PNT Milestone C Decision	3	2021	3	2021

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>				Project (Number/Name) EH9 / PSEUDOLITES			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EH9: PSEUDOLITES	-	19.551	57.411	79.230	-	79.230	44.768	8.407	0.000	0.000	0.000	209.367
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

PE 0604120A: EH9 - Pseudolite will transition from Budget Activity-4 to Budget Activity-5 in Fiscal Year 2020.

A. Mission Description and Budget Item Justification

Highly accurate Positioning, Navigation and Timing (PNT) data is a key enabler and a cross cutting capability for Army forces to execute their mission. The Army requires ground maneuver forces access to trusted PNT information under conditions where space-based PNT may be limited or denied to maintain its Global Positioning System (GPS) military advantage on the battlefield. The current GPS capability is a fixed frequency system which is vulnerable to current and emerging threats and field conditions.

Pseudolite (satellite-like transmitters) assure GPS access and integrity by providing PNT via terrestrial and airborne-based radio navigation GPS transmitters in electronically or physically challenged environments using a higher power signal. Area protection is provided through the deployment of Pseudolite transmitters supporting a Brigade Combat Team area of operations. Pseudolite supports continued operations of PNT-enabled systems such as Blue Force Tracker, Communications Networks and Precision Guided Munitions. Pseudolite consists of three segments:

1. Pseudolite Transmitter segment provides terrestrial and airborne radio navigation (GPS-like) service in electronically or physically challenged environments using a high power signal.
2. Command and Control (C2) segment to control the Pseudolite transmitters on the battlefield.
3. Receiver segment, which will develop software upgrades to current and future military GPS receivers to receive and process the Pseudolite signals.

FY 2018 Base funds in the amount of \$79.230 million are provided for the continuation of the Technology Maturation and Risk Reduction Phase, which includes additional testing and security certification efforts, and development of the Acquisition Requirements Package and other documentation to support the Developmental Request for Proposal Release Decision Point milestone.

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

	FY 2016	FY 2017	FY 2018
Title: Pseudolite	19.551	57.411	79.230
Description: Pseudolite Technology Maturation and Risk Reduction to reduce technology risk and to determine the appropriate set of technologies to be integrated into the full system.			
FY 2016 Accomplishments: FY16 Base funds continued the Technology Maturation and Risk Reduction phase of the Pseudolite system. These efforts include Pseudolite Transmitter prototyping, with two (2) contractors; development of prototype software for legacy GPS receiver(s), and			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH9 / <i>PSEUDOLITES</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>leveraging research and development efforts to support Command and Control (C2) prototype development. Additionally, funds were used for Assured PNT system architecture development to include: design trades and requirements trades analysis; mature and validate requirements; and performance of Cost Benefit Analysis.</p> <p>FY 2017 Plans: FY17 Base funds will continue the Technology Maturation and Risk Reduction prototyping and testing effort for the Pseudolite transmitter. Develop prototype software code for the remote C2 of Pseudolites over a tactical network. Continue the software upgrades to legacy receivers (e.g. DAGR) and develop software for Precision Guided Munitions to communicate with the Pseudolite transmitter. Efforts will focus on laboratory and field testing of Pseudolite prototypes; integration efforts with Pseudolite host platforms; finalization of design and requirements trades analysis; and finalization of a Cost Benefit Analysis.</p> <p>FY 2018 Plans: FY18 Base funds will continue the Technology Maturation and Risk Reduction prototyping and testing effort for the Pseudolite transmitter. In addition, efforts will continue the development of prototype software code for the remote C2 of Pseudolites over a tactical network. Other efforts include: software upgrades to legacy receivers and completion of software development for Precision Guided Munitions to communicate with the Pseudolite transmitter; Security Certification requirements and initial activities toward achievement; implementation of modifications and upgrades to prototypes based on testing results; integration development efforts with Pseudolite Ground and Air host platforms; support to Milestone B activities and documentation preparation/approval; and development of the Acquisition Requirements Package and other documentation to support the Developmental Request for Proposal Release Decision Point milestone.</p>				
Accomplishments/Planned Programs Subtotals		19.551	57.411	79.230
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
Assured Positioning, Navigation and Timing (PNT) is a system comprised of four products; Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and Anti-Jam Antenna System (AJAS), to assure access to and integrity of PNT information. Each product provides a degree of standalone capability, but only when deployed together can Assured PNT be achieved in all environments and across all formations and warfighting functions. Program Manager (PM) PNT manages these four products (Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and AJAS) constructed to develop, test, field, and sustain the A-PNT materiel solution. The final contracting strategy is under development.				

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH9 / <i>PSEUDOLITES</i>
<p>The Pseudolite Technology Maturation and Risk Reduction (TMRR) acquisition strategy was approved by the Milestone Decision Authority and Milestone A was successfully completed in May 2015. The Pseudolite product is currently in the TMRR Phase of the acquisition life-cycle.</p> <p>The TMRR Acquisition Strategy for Pseudolites includes: 1) Technology maturation of the Transmitter segment through the use of two prototyping, cost-plus fixed fee (CPFF) contracts; 2) Command and Control (C2) segment will leverage the development by other DoD agencies to the greatest extent possible; 3) Receiver segment will make the use of multiple contracts through existing vehicles for Pseudolite Receiver software prototype development.</p> <p><u>E. Performance Metrics</u> N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EH9 / PSEUDOLITES
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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			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	Total Cost	
Project Management Support - Government	Allot	PM PNT : APG, MD	0.000	0.800	Dec 2015	0.670	Oct 2016	4.713	Oct 2017	-		4.713	Continuing	Continuing	0.000
Project Management Support - Contractor	C/CPFF	Various : Various	0.000	0.228	Jan 2016	0.191	Dec 2016	1.571	Dec 2017	-		1.571	Continuing	Continuing	0.000
FFRDC	SS/CR	MITRE : Various	0.000	0.700	Jan 2016	0.586	Dec 2016	1.200	Dec 2017	-		1.200	Continuing	Continuing	0.000
Subtotal			0.000	1.728		1.447		7.484		-		7.484	-	-	0.000

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			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	Total Cost	
Pseudolite Prototype - Transmitter Contractor 1	C/CPFF	Datapath - Rockwell Collins : Cedar Rapids IA	0.000	5.663	Feb 2016	6.285	Dec 2016	5.806	Dec 2017	-		5.806	Continuing	Continuing	0.000
Pseudolite Prototype - Transmitter Contractor 2	C/CPFF	L-3 Communications : Anaheim, CA	0.000	5.663	Feb 2016	6.285	Dec 2016	6.398	Dec 2017	-		6.398	Continuing	Continuing	0.000
Engineering and Technical Product Support	MIPR	C4ISR : Various	0.000	-		-		3.560	Nov 2017	-		3.560	Continuing	Continuing	0.000
Pseudolite GPS Receiver Upgrade (DAGR & PGK)	SS/CPFF	Rockwell Collins & L-3 Communications : Cedar Rapids, IA & Anaheim, CA	0.000	0.393	Mar 2016	4.784	Dec 2016	11.407	Dec 2017	-		11.407	Continuing	Continuing	0.000
Pseudolite GPS Receiver Upgrade (GB-GRAM & Excalibur)	SS/CPFF	Rockwell Collins & L-3 Communications : Cedar Rapids, IA & Anaheim, CA	0.000	-		-		9.532	Dec 2017	-		9.532	Continuing	Continuing	0.000
Pseudolite Command & Control	C/Various	PEO Ammo & PM EW : Various	0.000	-		3.200	Dec 2016	10.177	Nov 2017	-		10.177	Continuing	Continuing	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)					Project (Number/Name)						
2040 / 4				PE 0604120A / Assured Positioning, Navigation and Timing (PNT)					EH9 / PSEUDOLITES						
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	Total Cost	Target Value of Contract
OEM Platform Integration Development for Air Platform	SS/CPFF	PEO Aviation : Various	0.000	-		14.543	Dec 2016	11.952	Dec 2017	-		11.952	Continuing	Continuing	0.000
OEM Platform Integration Development for Ground Platform 1, Platform 2, and Platform 3	SS/CPFF	Various : Various	0.000	-		11.654	Dec 2016	1.000	Dec 2017	-		1.000	Continuing	Continuing	0.000
PM Platform Integration Development	MIPR	Various : Various	0.000	-		2.000	Dec 2016	0.616	Dec 2017	-		0.616	Continuing	Continuing	0.000
Subtotal			0.000	11.719		48.751		60.448		-		60.448	-	-	0.000
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	Total Cost	Target Value of Contract
Engineering and Technical Services - Government	Various	C4ISR : Various	0.000	2.653	Jan 2016	2.222	Nov 2016	5.591	Nov 2017	-		5.591	Continuing	Continuing	0.000
Engineering and Technical Services - Contractor	C/CPFF	Various : Various	0.000	3.451	Jan 2016	2.891	Dec 2016	5.307	Dec 2017	-		5.307	Continuing	Continuing	0.000
Subtotal			0.000	6.104		5.113		10.898		-		10.898	-	-	0.000
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	Total Cost	Target Value of Contract
Pseudolite Prototype Lab and Field Testing	MIPR	Various : Various	0.000	-		2.100	Dec 2016	0.400	Nov 2017	-		0.400	Continuing	Continuing	0.000
Subtotal			0.000	-		2.100		0.400		-		0.400	-	-	0.000

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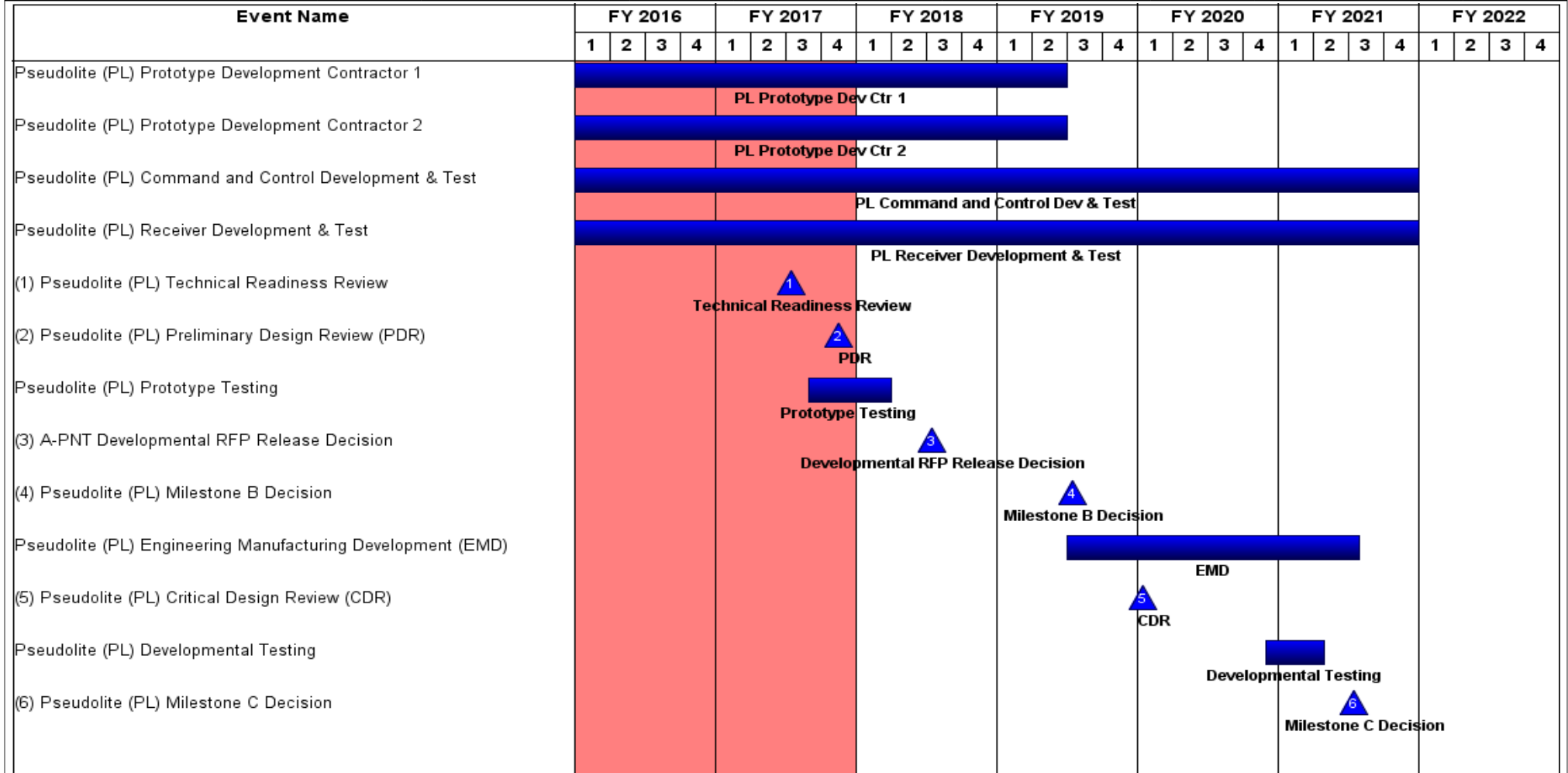
Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army								Date: May 2017					
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>				Project (Number/Name) EH9 / <i>PSEUDOLITES</i>					
	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	19.551		57.411		79.230		-		79.230	-	-	0.000

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date: May 2017**

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EH9 / PSEUDOLITES
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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EH9 / <i>PSEUDOLITES</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Pseudolite (PL) Prototype Development Contractor 1	3	2015	2	2019
Pseudolite (PL) Prototype Development Contractor 2	3	2015	2	2019
Pseudolite (PL) Command and Control Development & Test	3	2015	4	2021
Pseudolite (PL) Receiver Development & Test	3	2015	4	2021
Pseudolite (PL) Technical Readiness Review	3	2017	3	2017
Pseudolite (PL) Preliminary Design Review (PDR)	4	2017	4	2017
Pseudolite (PL) Prototype Testing	3	2017	1	2018
A-PNT Developmental RFP Release Decision	3	2018	3	2018
Pseudolite (PL) Milestone B Decision	3	2019	3	2019
Pseudolite (PL) Engineering Manufacturing Development (EMD)	3	2019	3	2021
Pseudolite (PL) Critical Design Review (CDR)	1	2020	1	2020
Pseudolite (PL) Developmental Testing	4	2020	2	2021
Pseudolite (PL) Milestone C Decision	3	2021	3	2021

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EJ2 / MOUNTED
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EJ2: MOUNTED	-	0.000	11.552	35.300	-	35.300	44.273	11.828	5.655	0.000	0.000	108.608
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note

PE 0604120A: EJ2 - Mounted Assured Positioning, Navigation and Timing (PNT) System will transition from Budget Activity-4 to Budget Activity-5 in Fiscal Year 2020.

A. Mission Description and Budget Item Justification

The Mounted Assured Positioning, Navigation and Timing (PNT) System provides PNT data and is a key enabler and a cross cutting capability for Army ground maneuver forces to execute their mission. Army ground maneuver Forces require access to trusted PNT information under conditions where space-based PNT may be limited or denied to maintain its Global Positioning System (GPS) military advantage on the battlefield. The current GPS capability is a fixed frequency system which is vulnerable to current and emerging threats and field condition.

Mounted A-PNT is a scalable form-factor that distributes PNT data to multiple devices (client systems) on mounted platforms. The system fuses military GPS with physics-based sensors and timing technology to provide trusted PNT data, which allows the Soldier to operate in GPS degraded or denied environments. Mounted A-PNT System includes receiver software capable of acquiring Pseudolite signals resulting in additional protection for military GPS in denied environments and paces the threat by including a migration path to Military Code (M-Code) and other future technologies.

FY 2018 Base funds in the amount of \$35.300 million are provided to support Milestone B regulatory/statutory activities to include documentation preparation/approval, critical risk reduction through focused prototyping with industry and Federally Funded Research & Development Center partners, standup of the Systems Integration Lab to begin early integration with over 40 client systems, and development of the Acquisition Requirements Package and other documentation to support the Developmental Request for Proposal Release Decision Point milestone.

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

	FY 2016	FY 2017	FY 2018
Title: Mounted A-PNT System	-	11.552	35.300
Description: Risk Reduction efforts to reduce technology risk and to determine the appropriate set of technologies to be integrated into the system.			
FY 2017 Plans: FY 2017 Base funds will transition the Communications Electronics Research Development and Engineering Center (CERDEC) Technology Maturation Initiative (TMI) efforts to the Mounted A-PNT System. These efforts will directly support critical risk reduction activities needed to meet the exit criteria to transition to the Engineering Manufacturing Development phase. Efforts will			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EJ2 / <i>MOUNTED</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
focus on sensor fusion and PNT distribution architecture. It will also include finalization of design and requirement trades analysis and integration efforts on host platforms; finalization of Cost Benefit Analysis. FY 2018 Plans: FY2018 Base funds will support regulatory/statutory activities required for a Milestone B decision in FY19 to include documentation preparation/approval, critical technology risk reduction through focused prototyping with industry and Federally Funded Research & Development Center partners, standup of the Systems Integration Lab to begin early integration with over 40 client systems, and development of the Acquisition Requirements Package and other documentation to support the Developmental Request for Proposal Release Decision Point milestone.				
Accomplishments/Planned Programs Subtotals		-	11.552	35.300
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy Assured Positioning, Navigation and Timing (PNT) is a system comprised of four products; Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and Anti-Jam Antenna System (AJAS), to assure access to and integrity of PNT information. Each product provides a degree of standalone capability, but only when deployed together can Assured PNT be achieved in all environments and across all formations and warfighting functions. Program Manager (PM) PNT manages these four products (Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and AJAS) constructed to develop, test, field, and sustain the A-PNT materiel solution. The final contracting strategy is under development. The Mounted A-PNT System acquisition strategy will begin at Milestone B. After successful Milestone B and award of the Engineering Manufacturing Development contract, development, integration and testing of the Mounted A-PNT System solution will begin.				
E. Performance Metrics N/A				

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)					Project (Number/Name) EJ2 / MOUNTED						
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	Total Cost	Target Value of Contract
Project Management Support - Government	Allot	PM PNT : APG, MD	0.000	-		0.386	Oct 2016	0.813	Oct 2017	-		0.813	Continuing	Continuing	0.000
Project Management Support - Contractor	C/CPFF	Various : Various	0.000	-		0.110	Dec 2016	0.271	Dec 2017	-		0.271	Continuing	Continuing	0.000
FFRDC	SS/CR	MITRE : Various	0.000	-		0.339	Dec 2016	1.200	Dec 2017	-		1.200	Continuing	Continuing	0.000
Subtotal			0.000	-		0.835		2.284		-		2.284	-	-	0.000
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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	Total Cost	Target Value of Contract
Prototype Development Contractor 1	C/CPFF	Rockwell Collins : Cedar Rapids, IA	0.000	-		3.885	Dec 2016	2.983	Dec 2017	-		2.983	Continuing	Continuing	0.000
Prototype Development Contractor 2	C/CPFF	Northrup Grumman : San Diego, CA	0.000	-		3.885	Dec 2016	2.583	Dec 2017	-		2.583	Continuing	Continuing	0.000
Engineering and Technical Product Support	MIPR	C4ISR : Various	0.000	-		-		2.300	Nov 2017	-		2.300	Continuing	Continuing	0.000
Early Platform Integration and Evaluation	MIPR	Various : Various	0.000	-		-		6.603	Dec 2017	-		6.603	Continuing	Continuing	0.000
Development of the Systems Engineering and Integration Lab	MIPR	CERDEC Command Power and Integration Directorate : APG, MD	0.000	-		-		8.092	Dec 2017	-		8.092	Continuing	Continuing	0.000
M-Code Small-Chip Development and Prototype to meet Army Requirements	MIPR	Air Force : Various	0.000	-		-		5.500	Jan 2018	-		5.500	Continuing	Continuing	0.000
Subtotal			0.000	-		7.770		28.061		-		28.061	-	-	0.000

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EJ2 / MOUNTED
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022																			
	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																
Mounted A-PNT Risk Reduction Activities													Risk Reduction Activities																															
(1) A-PNT Developmental RFP Release Decision													Developmental RFP Release Decision																1															
(2) Mounted A-PNT System Requirements Review/System Functional R													SRR/SFR																2															
(3) Mounted A-PNT Milestone B Decision													Milestone B Decision																3															
Mounted A-PNT Engineering Manufacturing Development (EMD)													EMD																4															
(4) Mounted A-PNT Critical Design Review	CDR				4																																							
Mounted A-PNT Developmental Testing	Developmental Testing				5																																							
(5) Mounted A-PNT Milestone C Decision	Milestone C Decis				5																																							

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EJ2 / <i>MOUNTED</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Mounted A-PNT Risk Reduction Activities	1	2017	3	2019
A-PNT Developmental RFP Release Decision	3	2018	3	2018
Mounted A-PNT System Requirements Review/System Functional Review	1	2019	1	2019
Mounted A-PNT Milestone B Decision	3	2019	3	2019
Mounted A-PNT Engineering Manufacturing Development (EMD)	3	2019	3	2022
Mounted A-PNT Critical Design Review	4	2020	4	2020
Mounted A-PNT Developmental Testing	3	2021	1	2022
Mounted A-PNT Milestone C Decision	3	2022	3	2022

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EJ3 / ANTI-JAM ANTENNA
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
EJ3: ANTI-JAM ANTENNA	-	0.000	0.000	12.023	-	12.023	18.775	29.993	8.146	1.673	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

PE 0604120A: EJ3 - Anti-Jam Antenna System will transition from Budget Activity-4 to Budget Activity-5 in Fiscal Year 2020.

A. Mission Description and Budget Item Justification

The Anti-Jam Antenna System (AJAS) provides point protection by steering electronic nulls at interference sources or beams at valid signal sources. This enables continuous GPS signal acquisition and tracking in a navigation warfare (jamming) environment. The AJAS is deployed as a scalable component accessory to the Mounted Assured Positioning, Navigation and Timing (PNT) System.

FY 2018 Base funds in the amount of \$12.023 million are provided to support Milestone B documentation preparation/approval, risk reduction activities to include: development of a Systems Integration Lab used for evaluation of system interoperability, platform integration, and evaluation of commercial AJAS using modeling and simulation; development/modification of commercial AJAS; Anechoic Chamber testing; live-sky testing and the development of the Acquisition Requirements Package to support the Request for Proposal Release Decision Point milestone.

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

	FY 2016	FY 2017	FY 2018
Title: Anti-Jam Antenna System	-	-	12.023
Description: Risk reduction activities associated with the AJAS to reduce technology risk and to determine the appropriate set of technologies to be integrated into the full system.			
FY 2018 Plans: FY2018 Base funds will provide support to Milestone B documentation preparation/approval, risk reduction activities to include: development of a Systems Integration Lab used for evaluation of system interoperability, platform integration, and evaluation of commercial AJAS using modeling and simulation; development/modification of commercial AJAS; Anechoic Chamber testing; live-sky testing and the development of the Acquisition Requirements Package to support the Developmental Request for Proposal Release Decision Point milestone.			
Accomplishments/Planned Programs Subtotals	-	-	12.023

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

N/A

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EJ3 / <i>ANTI-JAM ANTENNA</i>

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

Remarks

D. Acquisition Strategy

Assured Positioning, Navigation and Timing (PNT) is a system comprised of four products; Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and Anti-Jam Antenna System (AJAS), to assure access to and integrity of PNT information. Each product provides a degree of standalone capability, but only when deployed together can Assured PNT be achieved in all environments and across all formations and warfighting functions. Program Manager (PM) PNT manages these four products (Dismounted A-PNT System, Pseudolite, Mounted A-PNT System, and AJAS) constructed to develop, test, field, and sustain the A-PNT materiel solution. The final contracting strategy is under development.

The AJAS acquisition strategy will begin at Milestone B. After successful Milestone B and award of the Engineering Manufacturing Development contract, development, integration and testing of the AJAS solution will begin.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				EJ3 / ANTI-JAM ANTENNA							
Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management Support - Government	Allot	PM PNT : APG, MD	0.000	-		-		0.400	Nov 2017	-		0.400	Continuing	Continuing	0.000
Project Management Support - Contractor	C/CPFF	Various : Various	0.000	-		-		0.112	Dec 2017	-		0.112	Continuing	Continuing	0.000
FFRDC	SS/CR	MITRE : Various	0.000	-		-		0.600	Dec 2017	-		0.600	Continuing	Continuing	0.000
Subtotal			0.000	-		-		1.112		-		1.112	-	-	0.000
Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development of the Systems Engineering and Integration Lab	MIPR	CERDEC Command Power and Integration Lab : APG, MD	0.000	-		-		2.235	Dec 2017	-		2.235	Continuing	Continuing	0.000
Anti-Jam Antenna Hardware Simulation and Evaluation	MIPR	CERDEC - Command and Integration Directorate : APG, MD	0.000	-		-		3.717	Apr 2018	-		3.717	Continuing	Continuing	0.000
Early Platform Integration and Evaluation	MIPR	Various : Various	0.000	-		-		0.975	Dec 2017	-		0.975	Continuing	Continuing	0.000
Engineering and Technical Product Support	MIPR	C4ISR : Various	0.000	-		-		0.412	Nov 2017	-		0.412	Continuing	Continuing	0.000
Subtotal			0.000	-		-		7.339		-		7.339	-	-	0.000
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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 and Technical Services - Government	Various	C4ISR : Various	0.000	-		-		1.286	Nov 2017	-		1.286	Continuing	Continuing	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 4				PE 0604120A / Assured Positioning, Navigation and Timing (PNT)				EJ3 / ANTI-JAM ANTENNA							
Support (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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 and Technical Services - Contractor	C/CPFF	Various : Various	0.000	-		-		0.429	Dec 2017	-		0.429	Continuing	Continuing	0.000
Subtotal			0.000	-		-		1.715		-		1.715	-	-	0.000
Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Anti-Jam Antenna Live Sky Demo and Anechoic Chamber Test	MIPR	CERDEC - Command Power and Integration Directorate : APG, MD	0.000	-		-		1.857	Dec 2017	-		1.857	Continuing	Continuing	0.000
Subtotal			0.000	-		-		1.857		-		1.857	-	-	0.000
Project Cost Totals			0.000	-		0.000		12.023		-		12.023	-	-	0.000
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / Assured Positioning, Navigation and Timing (PNT)	Project (Number/Name) EJ3 / ANTI-JAM ANTENNA
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022							
	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				
Anti-Jam Antenna Risk Reduction Activities									Risk Reduction Activities																							
(1) A-PNT Developmental RFP Release Decision													1 ▲ Developmental RFP Release Decision																			
(2) Anti-Jam Antenna System Requirements Review/System Functional																	2 ▲ SRR/SFR															
(3) Anti-Jam Antenna Milestone B Decision																	3 ▲ Milestone B Decision															
Ant-Jam Antenna Engineering Manufacturing Development (EMD)																					EMD											
(4) Anti-Jam Antenna Critical Design Review																	4 ▲ CDR															
Anti-Jam Antenna Developmental Testing																					Developmental Testing											
(5) Anti-Jam Antenna Milestone C Decision																									5 ▲ Milestone C Decis							

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604120A / <i>Assured Positioning, Navigation and Timing (PNT)</i>	Project (Number/Name) EJ3 / ANTI-JAM ANTENNA

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Anti-Jam Antenna Risk Reduction Activities	1	2018	3	2019
A-PNT Developmental RFP Release Decision	3	2018	3	2018
Anti-Jam Antenna System Requirements Review/System Functional Review	2	2019	2	2019
Anti-Jam Antenna Milestone B Decision	3	2019	3	2019
Ant-Jam Antenna Engineering Manufacturing Development (EMD)	3	2019	3	2022
Anti-Jam Antenna Critical Design Review	4	2020	4	2020
Anti-Jam Antenna Developmental Testing	3	2021	1	2022
Anti-Jam Antenna Milestone C Decision	3	2022	3	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 0604121A / Synthetic Training Environment Refine & Prototype
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	1.600	-	1.600	15.044	20.648	32.023	40.048	Continuing	Continuing
FD6: Synthetic Training Environment Refine & Prototype	-	0.000	0.000	1.600	-	1.600	15.044	20.648	32.023	40.048	Continuing	Continuing

Note

The STE Program is a new start for FY2018.

A. Mission Description and Budget Item Justification

The Synthetic Training Environment (STE) is the next generation holistic collective training capability that will train units at the point of need within the entire range of Decisive Action tasks in support of Unified Land Operations in a complex operational environment. STE will be a synthetic environment utilizing one world terrain, common authoritative data and models that is cloud-enabled through the Army Enterprise Network, and is service-based through the Common Operating Environment, available for use anywhere a Soldier needs it.

FY 2018 base funding of \$1.600 million will prepare the program for Milestone A, which includes Materiel Developer (MATDEV) participation with Analysis of Alternatives (AoA) planning, CONOPS update, and Capabilities Development Document (CDD) refinement. The base funding also facilitates work effort to complete statutory and regulatory acquisition artifacts in support of Milestone (MS) A. The resourcing profile established in the POM1822 cycle ensures the STE concept is matured to a formal acquisition program of record with planned MS A in FY19 and MS B in FY22.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	1.600	-	1.600
Total Adjustments	0.000	0.000	1.600	-	1.600
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	1.600	-	1.600

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4				R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refine & Prototype</i>				Project (Number/Name) FD6 / <i>Synthetic Training Environment Refine & Prototype</i>				
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
FD6: <i>Synthetic Training Environment Refine & Prototype</i>	-	0.000	0.000	1.600	-	1.600	15.044	20.648	32.023	40.048	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The STE Program is a new start for FY2018.

A. Mission Description and Budget Item Justification

The Synthetic Training Environment (STE) is the next generation holistic collective training capability that will train units at the point of need within the entire range of Decisive Action tasks in support of Unified Land Operations in a complex operational environment. STE will be a synthetic environment utilizing one world terrain, common authoritative data and models that is cloud-enabled through the Army Enterprise Network, and is service-based through the Common Operating Environment, available for use anywhere a Soldier needs it.

FY 2018 base funding of \$1.600 million will prepare the program for Milestone A, which includes Materiel Developer (MATDEV) participation with Analysis of Alternatives (AoA) planning, CONOPS update, and Capabilities Development Document (CDD) refinement. The base funding also facilitates work effort to complete statutory and regulatory acquisition artifacts in support of Milestone (MS) A. The resourcing profile established ensures the STE concept is matured to a formal acquisition program of record with planned MS A in FY19 and MS B in FY22.

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

	FY 2016	FY 2017	FY 2018
Title: STE Program Management	-	-	1.600
FY 2018 Plans: Funding will be used for STE Program Management to execute Materiel Solutions Analysis (MSA) phase of the STE program with the purpose to choose the concept for the product that will be acquired, to begin translating validated capability gaps into system-specific requirements, including the Key Performance Parameters (KPPs) and Key System Attributes (KSAs), and to conduct planning to support a decision on the acquisition strategy for the product.			
Accomplishments/Planned Programs Subtotals	-	-	1.600

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

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604121A / <i>Synthetic Training Environment Refine & Prototype</i>	Project (Number/Name) FD6 / <i>Synthetic Training Environment Refine & Prototype</i>

D. Acquisition Strategy

The Synthetic Training Environment (STE) program will employ an incremental acquisition strategy where the full capability will occur in multiple increments as new capability is developed and delivered. During Materiel Solutions Analysis (MSA) and Technology Maturation Risk Reduction (TMRR) phases competitive prototyping development efforts will be awarded based on performance specifications. Milestone B (MSB) is anticipated in FY22 to enter into Engineering & Manufacturing Development (EMD).

E. Performance Metrics

N/A

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604319A / <i>Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	149.222	0.000	11.303	-	11.303	52.604	239.305	259.804	316.104	Continuing	Continuing
DU3: <i>IFPC2</i>	-	149.222	0.000	11.303	-	11.303	52.604	239.305	259.804	316.104	Continuing	Continuing

Note

Funding for FY17 and out for IFPC Inc 2-I Block 1 system development activities has been realigned from BA4, PE 0604319/DU3 to BA5, PE 0605052/EY7 as the program transitions to EMD.

A. Mission Description and Budget Item Justification

This program supports the overall integrated Air and Missile Defense (AMD) architecture and provides a robust intercept capability against Cruise Missiles (CM), Unmanned Aircraft System (UAS) and an initial capability against Rocket, Artillery, and Mortar (RAM) threats for deployed forces, to include continued analysis and design.

The Indirect Fire Protection Capability Increment 2 - Intercept (IFPC Inc 2-I) is a ground-based weapon system that will be designed to acquire, track, engage, and defeat the UAS, CM, and RAM threats. Initial IFPC 2-I system development was funded on this line through FY16. The system will provide 360-degree protection and will simultaneously engage threats arriving from different azimuths. A block acquisition approach will be used to provide this capability. The IFPC Inc 2-I Block 1 system will consist of an existing interceptor and sensor and development of fire control software and a Multi-Mission Launcher (MML) to support the UAS and CM defeat mission. The IFPC Inc 2-I system will be compatible with the Army Integrated Air and Missile Defense (IAMD) Command and Control (C2) architecture. The IFPC Inc 2-I system will be transportable by Army common mobile platforms.

The IFPC Inc 2-I second interceptor will expand the Block 1 system's target set by enabling an initial counter - rocket, artillery, and mortar (C-RAM) capability through a kinetic intercept capability. Integration of second interceptor for IFPC Inc 2-I Block 1.

FY2018 base dollars in the amount of \$11.303 million funds the integration and testing of a second interceptor into the IFPC Inc 2-I Block 1 Multi-Mission Launcher.

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604319A / <i>Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	155.361	0.000	40.003	-	40.003
Current President's Budget	149.222	0.000	11.303	-	11.303
Total Adjustments	-6.139	0.000	-28.700	-	-28.700
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-6.139	-			
• Adjustments to Budget Year	0.000	0.000	-28.700	-	-28.700

Change Summary Explanation

Funding for IFPC Inc 2-I Block 1 system development activities was realigned in accordance with the Army Cost Position from BA4, PE 0604319/DU3 to BA5, PE 0605052/EY7 as the program transitions to EMD, the remaining \$11.3M in FY18 funds were designated for IFPC Inc 2-I Block 1 Second Interceptor development, integration, and testing.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604319A / <i>Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)</i>	Project (Number/Name) DU3 / <i>IFPC2</i>
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
DU3: <i>IFPC2</i>	-	149.222	0.000	11.303	-	11.303	52.604	239.305	259.804	316.104	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding for FY17 and out for IFPC Inc 2-I Block 1 system development activities has been realigned from BA4, PE 0604319/DU3 to BA5, PE 0605052/EY7 as the program transitions to EMD.

A. Mission Description and Budget Item Justification

This program supports the overall integrated Air and Missile Defense (AMD) architecture and provides a robust intercept capability against Cruise Missiles (CM), Unmanned Aircraft System (UAS) and an initial capability against Rocket, Artillery, and Mortar (RAM) threats for deployed forces, to include continued analysis and design.

The Indirect Fire Protection Capability Increment 2 - Intercept (IFPC Inc 2-I) is a ground-based weapon system that will be designed to acquire, track, engage, and defeat the UAS, CM, and RAM threats. Initial IFPC 2-I system development was funded on this line through FY16. The system will provide 360-degree protection and will simultaneously engage threats arriving from different azimuths. A block acquisition approach will be used to provide this capability. The IFPC Inc 2-I Block 1 system will consist of an existing interceptor and sensor and development of fire control software and a Multi-Mission Launcher (MML) to support the UAS and CM defeat mission. The IFPC Inc 2-I system will be compatible with the Army Integrated Air and Missile Defense (IAMD) Command and Control (C2) architecture. The IFPC Inc 2-I system will be transportable by Army common mobile platforms.

The IFPC Inc 2-I second interceptor will expand the Block 1 system's target set by enabling an initial counter - rocket, artillery, and mortar (C-RAM) capability through a kinetic intercept capability. Integration of second interceptor for IFPC Inc 2-I Block 1.

FY2018 base dollars in the amount of \$11.303 million funds integration and testing of a second interceptor into the IFPC Inc 2-I Block 1 Multi-Mission Launcher.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: System Engineering & Program Management (SEPM)	26.534	-	6.503	-	6.503
Description: Funding is provided for the following efforts:					
FY 2016 Accomplishments:					
- Continue RDT&E efforts associated with Engineering Demonstration					
- Perform system engineering, logistics engineering, system test and evaluation management, technical control, and business management activities					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604319A / <i>Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)</i>	Project (Number/Name) DU3 / <i>IFPC2</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<ul style="list-style-type: none"> - Conduct system and program reviews - Perform technical assessments, concept studies, cost reduction, risk reduction, and required documentation - Conduct Milestone B preparation, documentation, and execution activities - Transition from Technology Maturation and Risk Reduction (TMRR) to Engineering and Manufacturing Development (EMD) phase - Begin Interceptor Pre-Milestone preparation and documentation activities <p>FY 2018 Base Plans:</p> <ul style="list-style-type: none"> - Initiate RDT&E efforts associated with IFPC Increment 2-I Block 1 second interceptor - Perform system engineering, integration, logistics engineering, system test and evaluation management, technical configuration control, cost and business management activities - Conduct system technical reviews and program management reviews - Perform technical assessments, concept studies, cost reduction, risk reduction, and required documentation - Conduct program decision preparation, documentation, and execution activities 					
<p>Title: Engineering and Technical Support</p> <p>Description: Funding is provided for the following efforts:</p> <p>FY 2016 Accomplishments:</p> <ul style="list-style-type: none"> - Continue engineering and technical support for design of system hardware, software, and integration requirements and definition, to include all Major End Items (MEIs) - Participate in system and program reviews - Perform technical assessments, concept studies, cost reduction, risk reduction, Engineering Demonstration, and required documentation <p>FY 2018 Base Plans:</p> <ul style="list-style-type: none"> - Initiate IFPC Increment 2-I Block 1 second interceptor engineering and technical support for design of system hardware, software, and integration requirements and definition - Participate in system technical and program management reviews - Perform technical assessments, concept studies, cost reduction, risk reduction, and required documentation 	46.609	-	0.200	-	0.200
<p>Title: System/Subsystem Development and Integration</p> <p>Description: Funding is provided for the following efforts:</p> <p>FY 2016 Accomplishments:</p>	76.079	-	4.191	-	4.191

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604319A / <i>Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)</i>	Project (Number/Name) DU3 / <i>IFPC2</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<ul style="list-style-type: none"> - Continue system component hardware, software, and integration development activities - Participate in system and program reviews - Continue development of technical data package - Perform technical assessments, concept studies, cost reduction, required documentation, integration, component, and system level risk reduction - Continue system/subsystem hardware, software, and integration test activities - Complete manufacturing, assembly, and integration of Multi-Mission Launcher (MML) prototypes - Conduct Engineering Demonstration - Purchase test assets, components, and risk reduction items <p>FY 2018 Base Plans:</p> <ul style="list-style-type: none"> - Initiate IFPC Increment 2-I Block 1 second interceptor hardware and software integration activities - Participate in system technical and program management reviews - Perform technical assessments, concept studies, cost reduction, required documentation, integration and component risk reduction 					
Title: System/Subsystem Developmental Testing	-	-	0.409	-	0.409
<p>FY 2018 Base Plans:</p> <ul style="list-style-type: none"> - Initiate Developmental testing activities - Initiate Modeling and Simulation test activities - Initiate Cyber Security test activities 					
Accomplishments/Planned Programs Subtotals	149.222	-	11.303	-	11.303

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PE 0605456A, Proj PA3: <i>PAC-3/MSE MISSILE</i>	2.201	-	-	-	-	-	-	-	-	0.000	2.201
• SSN C53101: <i>MSE Missile</i>	514.946	702.201	459.040	-	459.040	499.915	540.669	523.413	524.934	Continuing	Continuing
• PE 0205456A, Proj EF9: <i>System Integration and Test</i>	61.653	73.417	78.926	-	78.926	80.314	109.222	112.614	123.007	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604319A / <i>Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)</i>	Project (Number/Name) DU3 / <i>IFPC2</i>
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• PE 0604114A, Proj EX2: <i>Lower Tier Air Missile Defense (LTAMD) Capability</i>	-	35.132	76.728	-	76.728	67.088	83.195	141.185	142.000	Continuing	Continuing
• SSN C50016: <i>Lower Tier Air and Missile Defense (AMD)</i>	130.275	126.470	140.826	-	140.826	125.161	144.243	119.282	121.825	Continuing	Continuing
• PE 0605052A, Proj EY7: <i>IFPC Increment 2 - Block 1</i>	-	83.995	175.069	-	175.069	149.506	52.300	24.700	-	Continuing	Continuing
• SSN C62002: <i>IFPC Inc 2-I Block 1 Missile</i>	-	19.319	-	-	-	31.641	191.830	315.025	277.500	Continuing	Continuing
• SSN C62001: <i>IFPC Inc 2-I Block 1 System</i>	-	-	57.742	-	57.742	157.406	144.740	100.400	14.600	Continuing	Continuing
• PE 0604820A, Proj E10: <i>Sentinel</i>	11.821	15.983	32.968	-	32.968	31.761	51.897	72.562	81.351	Continuing	Continuing
• PE 0605457A, Proj S40: <i>Army Integrated Air and Missile Defense (AIAMD)</i>	222.074	272.811	336.420	-	336.420	290.250	190.600	117.470	64.510	Continuing	Continuing
• SSN BZ5075: <i>IAMD Battle Command System</i>	20.917	204.969	-	-	-	-	274.494	375.026	513.464	Continuing	Continuing
• PE 604741A, Proj 146, 149: <i>Air Defense C2I Eng Dev</i>	33.619	61.532	28.726	-	28.726	28.320	14.638	8.674	-	Continuing	Continuing
• SSN AD50700: <i>AIR & MSL Defense Planning & Control Sys</i>	28.176	126.539	26.635	24.100	50.735	17.960	6.366	32.397	-	Continuing	Continuing
• SSN C62004: <i>IFPC Inc 2-I Block 2 Missile</i>	-	-	-	-	-	-	-	-	12.300	Continuing	Continuing
• PE 0605457A, Proj DU4: <i>Advanced Electronic Protection Enhancements AEPE</i>	-	-	23.164	-	23.164	25.010	26.719	26.218	26.500	Continuing	Continuing

Remarks

This program is an integral part of the Army Integrated Air and Missile Defense (IAMD) architecture.

D. Acquisition Strategy

Funding for FY17 and out for IFPC Inc 2-I Block 1 system development activities has been realigned from BA4, PE 0604319/DU3 to BA5, PE 0605052/EY7 as the program transitions to EMD. Funding for FY18 and out is programmed for IFPC Inc 2-I Block 1 second interceptor.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604319A / Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	Project (Number/Name) DU3 / IFPC2

The IFPC Inc 2-I Block 1 Product Office successfully completed a Milestone B Army System Acquisition Review Council (ASARC) on 21 November 2016.

The IFPC Inc 2-I Block 1 Second Interceptor Product Office will seek a program decision in 1QFY18. The IFPC Inc 2-I Block 1 Second Interceptor Product Office plans to award funds for the integration and testing of the second interceptor utilizing a two-phased approach with a demonstration of interceptors from multiple vendors during phase one with a down-select to a single vendor for phase two. Phase two will consist of activities to finalize design and integration of the interceptor and conduct developmental testing.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604319A / Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	Project (Number/Name) DU3 / IFPC2
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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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 Admin (IFPC Base System)	MIPR	Cruise Missile Defense Systems Project Office : Huntsville, Alabama	18.656	9.988	Jan 2016	-		-		-		-	Continuing	Continuing	Continuing
Program Management Admin	Various	Various : Huntsville, Alabama	0.000	-		-		4.903	Oct 2017	-		4.903	Continuing	Continuing	Continuing
Subtotal			18.656	9.988		-		4.903		-		4.903	-	-	-

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System Engineering & Integration (IFPC Base System)	MIPR	Cruise Missile Defense Systems Project Office : Huntsville, AL	37.917	16.546	Jan 2016	-		-		-		-	Continuing	Continuing	Continuing
System Engineering & Integration	MIPR	Cruise Missile Defense Systems Project Office : Huntsville, AL	0.000	-		-		1.600	May 2018	-		1.600	Continuing	Continuing	Continuing
Engineering and Technical Support (IFPC Base System)	MIPR	Multiple Activities : Multiple Locations	94.215	46.609	Jan 2016	-		-		-		-	Continuing	Continuing	Continuing
Engineering and Technical Support	MIPR	Multiple Activities : Multiple Locations	0.000	-		-		0.200	May 2018	-		0.200	Continuing	Continuing	Continuing
System/Subsystem Development and Integration (IFPC Base System)	MIPR	Multiple Activities : Multiple Locations	43.956	76.079	Jan 2016	-		-		-		-	Continuing	Continuing	Continuing
System/Subsystem Development and Integration	MIPR	Multiple Activities : Multiple Locations	0.000	-		-		4.191	May 2018	-		4.191	Continuing	Continuing	Continuing

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date: May 2017**

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604319A / <i>Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)</i>	Project (Number/Name) DU3 / IFPC2
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	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
Block 1 Pre-Milestone (MS) B Activities	Blk 1 Pre-MS B Activities																											
Engineering Demonstration (ED)	ED																											
Block 1 Second Interceptor Pre-MS B Activities									Pre-MS B Activities																			
(1) Block 1 Second Interceptor MS B													MS B															
Block 1 Second Interceptor Engineering and Manufacturing Development													Engineering and Manufacturing Development															
(2) Block 1 Second Interceptor MS C																	MS C											
Block 1 Second Interceptor Low Rate Initial Production (LRIP)																					LRIP							
(3) Block 1 Second Interceptor Initial Operational Capability (IOC)																					IOC							

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0604319A / <i>Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)</i>	Project (Number/Name) DU3 / <i>IFPC2</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Block 1 Pre-Milestone (MS) B Activities	1	2014	1	2017
Engineering Demonstration (ED)	2	2016	3	2016
Block 1 Second Interceptor Pre-MS B Activities	1	2018	4	2018
Block 1 Second Interceptor MS B	1	2019	1	2019
Block 1 Second Interceptor Engineering and Manufacturing Development	1	2019	4	2021
Block 1 Second Interceptor MS C	1	2022	1	2022
Block 1 Second Interceptor Low Rate Initial Production (LRIP)	1	2022	4	2022
Block 1 Second Interceptor Initial Operational Capability (IOC)	4	2022	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity					R-1 Program Element (Number/Name)							
2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)					PE 0305251A / Cyberspace Operations Forces and Force Support							
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	40.510	56.492	-	56.492	52.817	52.102	53.578	54.697	Continuing	Continuing
FA8: Cyberspace Operations Forces and Force Support	-	0.000	40.510	56.492	-	56.492	52.817	52.102	53.578	54.697	Continuing	Continuing

A. Mission Description and Budget Item Justification

In support of the 2016 National Defense Authorization Act, Section 1645, the Persistent Cyber Training Environment (PCTE) will provide the Department of Defense (DoD) cyber forces with a standardized training capability with access to existing Cyber Training Ranges and available training resources and content. The current environment does not have the capacity to maintain a persistent environment and is primarily used for major exercises (i.e. Cyber Flag). The Service Cyber Components have established their own training environments but do not have standardized capabilities or content. PCTE system approaches are aligned to the outputs of the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (OUSD AT&L) and Chairman of the Joint Chiefs of Staff (CJCS) J6 led, "Cyber Range Evaluation of Alternatives (EOA) Findings and Issue Paper Deliberations," dated 17 November 2015. The Program Executive Office for Simulation, Training, and Instrumentation (PEO STRI) was designated as the DoD Acquisition Lead for the PCTE.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	40.510	56.509	-	56.509
Current President's Budget	0.000	40.510	56.492	-	56.492
Total Adjustments	0.000	0.000	-0.017	-	-0.017
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	-0.017	-	-0.017

Change Summary Explanation

FY18 funding change is a price adjustment.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>				Project (Number/Name) FA8 / <i>Cyberspace Operations Forces and Force Support</i>			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
FA8: <i>Cyberspace Operations Forces and Force Support</i>	-	0.000	40.510	56.492	-	56.492	52.817	52.102	53.578	54.697	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Persistent Training Environment (PTE) will provide the Department of Defense (DoD) cyber force with a capability that uses a combination of loosely affiliated or independent virtual environments with varied capabilities that are not scalable or extensible. The current environment constrains training capabilities and capacity, but lack a joint or standard approach consistent with a broader vision of PTE. PTE system approaches are aligned to the outputs of the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (OUSD AT&L) and Chairman of the Joint Chiefs of Staff (CJCS) J6 led, "Cyber Range Evaluation of Alternatives (EOA) Findings and Issue Paper Deliberations," dated 17 November 2015. The US Army acknowledges it is the lead candidate service to perform as the Executive Agent (EA) for Cyber Training Ranges and DoD Acquisition Lead for the PTE. Program is directed by the 2016 National Defense Authorization Act, Section 1645.

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

	FY 2016	FY 2017	FY 2018
Title: Event Management for Persistent Cyber Training Environment (PCTE)	-	10.510	18.600
Description: Develop event scheduling, allocation, and management function for PCTE, to include event design, planning and execution, supported by standardized training assessment tools and capabilities.			
FY 2017 Plans: PCTE event management to include the OPFOR environment, system capacity, modeling, simulation, assessments and management. The OPFOR environment provides the capability to support live and automated OPFOR events which are realistically tailored to the training audience. System Capacity includes the capability to support individual and collective training, certification and recertification activities within definitive timelines. Modeling and simulation provides training event data collection for event replay and archiving to include operation of the cyber range, instrumentation and tools. The assessments and management capability will provide oversight and feedback support to include analytics, metrics, and Master Scenario Event List (MSEL) execution.			
FY 2018 Plans: Continue development and management of Event Management for PCTE, to include the physical and logical infrastructure of the training platform and core training environment that allows for automated training events at the individual and team level. It will also include instances at the unclassified, secret, and top secret classification levels. Event management is the integration of multiple applications that support a training event. The capabilities include a master control, centralized order portal, event design, event control, automated opposition force, technical support, assessments and feedback, content library and tool management repository, and a virtual classroom. FY17 included the procurement and evaluation of event management			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) FA8 / <i>Cyberspace Operations Forces and Force Support</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
application prototypes. In FY18, those event management applications will be integrated into a PCTE platform and provided to the Service Cyber components.				
<p>Title: Environment operations and management for Persistent Cyber Training Environment (PCTE)</p> <p>Description: Develop PCTE with realistic vignettes/scenarios as part of a system (syllabus) of individual and collective training that includes certification and real-world mission rehearsals.</p> <p>FY 2017 Plans: Develop the PCTE environment with realistic vignettes/scenarios as part of a system (syllabus) of individual and collective training that includes certification and real-world mission rehearsals. This includes interoperability (capability to generate a training network that is able to emulate an operational network), system capacity (capability to reconstitute the environment from a given save point. Incorporates pre-determined standardized environment constructs and scenarios), and modeling and simulations (capability to replicate current/future requirements and threats.)</p> <p>FY 2018 Plans: Provides for the creation of a robust cloud network connecting participating cyber training ranges and the ability for the PCTE to utilize resources and content at the participating cyber ranges. This eliminates the need to replicate those environments for every PCTE instantiation. The environment includes the emulation of blue, red, green, and gray networks as well as the ability to replicate Industrial Control Systems (ICS) and Supervisory Control and Data Acquisition (SCADA) environments. These environments provide the “maneuver” space and training grounds for Cyber Mission Forces (CMF). FY18 will provide the virtual connections with the PCTE in order for the CMF trainee to choose the maneuver environment while establishing the training event. This will also include the ability to “clean” after the completion of training so that the next student has a neutral environment. This will also include the ability to use current threat information and intelligence to ensure that the environments remain current and relevant providing a realistic training environment.</p>		-	10.000	14.130
<p>Title: Physical and Virtual Connectivity for the Persistent Cyber Training Environment (PCTE)</p> <p>Description: On-Demand reliable, secure physical and virtual global access from wherever participants are geographically located. A core cyber exercise network and event management platform with access to the full suite of DoD, Service, Interagency, Multinational, and States’ distributed systems.</p> <p>FY 2017 Plans: Provides for the connectivity of on-demand and reliable secure physical and virtual global access from wherever participants are geographically located. A core cyber exercise network and event management platform with access to the full suite of DoD, Service, Interagency, Multinational, and States’ distributed systems. Connectivity includes system accessibility (capability to provide user interface as well as facilitate user provided assets such as crew training facility, system under test, and other user</p>		-	10.000	19.780

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) FA8 / <i>Cyberspace Operations Forces and Force Support</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>assets), system capacity (capability to support network capacity for multiple engagements from multiple sites and connections to include intra-range entities, between ranges, cross-domain solutions, and other resources), interoperability (capability to ensure interoperability standards for integration of environments and service assets at geographically separated locations) and cyber security measures (capability to ensure continuous enforcement of security policies to prevent successful intrusions, protect data at rest, and eradicate the threat to and cause of any incident.)</p> <p>FY 2018 Plans: Provides for the connectivity at multiple security levels and the compute and storage requirements to support the processing of the PCTE and required data. FY18 will provide robust connectivity to the cyber ranges defined in the PCTE Initial Capability Document, in support of Section 1645 of the 2016 NDAA. The new sites will support the establishment of the cloud environment and provide the access to the resources and content from the participating cyber training ranges and the Service Cyber components.</p>				
<p>Title: Training Sites</p> <p>Description: Capability to enable and provide the Cyber Mission Forces (CMF) to connect to the PCTE from Base, Post, Camp, Station, or Deployed Locations for distributed cyber training, certification, and major training events.</p> <p>FY 2017 Plans: Provides capability to the training sites to enable and provide the CMF to connect to the PCTE from Base, Post, Camp, Station, or Deployed Locations for distributed cyber training, certification, and major training events. Capabilities include system capacity and system accuracy (capability to connect training sites to PCTE (Unclassified through Top Secret and SAP) and to develop foundational documentation or continuous rework of documentation to include team Tactics, Techniques and Procedures (TTPs) and Validation.)</p>		-	10.000	-
<p>Title: Government Program Management for Persistent Cyber Training Environment (PCTE)</p> <p>FY 2018 Plans: Will provide program management, engineering and technical oversight, contract support and travel for the PCTE program.</p>		-	-	2.300
<p>Title: Persistent Cyber Training Environment (PCTE) Test and Evaluation</p> <p>FY 2018 Plans: Persistent Cyber Training Environment is the integration of multiple applications and environments as well as connectivity to the existing Cyber Ranges. These funds will provide for required significant testing. This funding will be used for integration testing, field evaluations, and operational testing.</p>		-	-	1.682
Accomplishments/Planned Programs Subtotals		-	40.510	56.492

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) FA8 / <i>Cyberspace Operations Forces and Force Support</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2016</u>	<u>FY 2017</u>	<u>FY 2018</u> <u>Base</u>	<u>FY 2018</u> <u>OCO</u>	<u>FY 2018</u> <u>Total</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• OMA 121251000: <i>Cyberspace Operations Forces and Force Support</i>	-	-	6.300	-	6.300	11.300	11.300	11.600	11.600	0	52.100
• OPA B65011000: <i>Persistent Cyber Training Environment</i>	-	-	4.000	-	4.000	3.000	3.000	3.000	-	0	13.000

Remarks

D. Acquisition Strategy

The Persistent Cyber Training Environment (PCTE) program will employ an incremental acquisition strategy. The strategy leverages the use of existing cyber contract vehicles in FY17 and FY18 to meet urgent requirements. Efforts in FY18 focus on augmenting connectivity (access), integrating existing Service capabilities into a common repository, and developing tools to enhance training of Cyber Mission Forces (CMF). A full and open competitive contract will be awarded in FY19 for development efforts based on performance specifications to include scope to support training and sustainment.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) FA8 / <i>Cyberspace Operations Forces and Force Support</i>
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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Program Management	TBD	Various : Various	0.000	-		-		2.300	Oct 2017	-		2.300	Continuing	Continuing	Continuing
Subtotal			0.000	-		-		2.300		-		2.300	-	-	-

Product Development (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
Operations Forces and Force Support	C/TBD	Various : Various	0.000	-		40.510		52.509		-		52.509	Continuing	Continuing	Continuing
Subtotal			0.000	-		40.510		52.509		-		52.509	-	-	-

Remarks
FY17 funds are being realigned to PEO STRI. FY18 funds will be placed as an option on the FY17 contract.

Test and Evaluation (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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			
PCTE Test and Evaluation	TBD	To Be Determined : To Be Determined	0.000	-		-		1.683		-		1.683	Continuing	Continuing	Continuing
Subtotal			0.000	-		-		1.683		-		1.683	-	-	-

			Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			0.000	-	-	40.510		56.492		-		56.492	-	-	-

Remarks

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 0305251A / <i>Cyberspace Operations Forces and Force Support</i>	Project (Number/Name) FA8 / <i>Cyberspace Operations Forces and Force Support</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Event Management	1	2017	4	2022
Environment	1	2017	4	2022
Connectivity	1	2017	4	2022
Training Sites	1	2017	4	2022

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)	R-1 Program Element (Number/Name) PE 1206308A / Army Space Systems Integration
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COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	20.432	-	20.432	24.127	22.633	21.041	43.869	Continuing	Continuing
FE5: Space And Missile Defense Integration	-	0.000	0.000	15.966	-	15.966	18.165	17.551	20.680	21.187	0.000	93.549
FE6: Army Space System Enhancement/Integration	-	0.000	0.000	4.466	-	4.466	5.962	5.082	0.361	22.682	Continuing	Continuing

A. Mission Description and Budget Item Justification

- PE 0603308A project 990 transition to PE 1206308A project FE5 beginning in FY 2018.
- PE 0603308A project EB7 transition to PE 1206308A project FE6 and PE 1205117A project FG3 beginning in FY 2018.

This program element funds space systems integration efforts performed by the US Army Space and Missile Defense Command/ Army Forces Strategic Command (USASMDC/ARSTRAT) and the Program Executive Office for Intelligence, Electronic Warfare (PEO IEW&S).

Project FE5 funds USASMDC/ARSTRAT to integrate warfighting concepts and technologies, validate concepts, and identify capabilities needed to implement the validated concepts, and develop DOTMLPF solutions to realize those space and high altitude related capabilities. Provide engineering support to the Joint Friendly Force Tracking (J-FFT) Mission Management Center (MMC) through an associated test-bed for both operational and developmental injection and integration of real-time J-FFT information into the Common Operating Picture (COP) for Combatant Commanders (COCOMs), Joint Task Forces (JTFs), and Coalition Partners. The MMC injects real-time J-FFT information into the COP for COCOMs, JTFs and Coalition partners. USSTRATCOM, in accordance with CJCSI 3910.01 (reference V.4.) is designated one of three coordinating agencies for J-FFT within DoD. CJCSI 3910.01 directs eight Force Modernization tasks to USSTRATCOM. USSTRATCOM SI 534-5 (reference V.6.) and annually published USSTRATCOM operations orders have designated USASMDC/ARSTRAT as the lead USSTRATCOM component command for Friendly Force Tracking (FFT).

Project FE6: Details of this program are reported in accordance with Title 10, United States Code, Section 119 (a)(1).

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Army	Date: May 2017
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Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 1206308A / <i>Army Space Systems Integration</i>
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B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	20.432	-	20.432
Total Adjustments	0.000	0.000	20.432	-	20.432
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	20.432	-	20.432

Change Summary Explanation

PE 0603308A project 990 transition to PE 1206308A project FE5 beginning in FY 2018.

PE 0603308A project EB7 transition to PE 1206308A project FE6 and PE 1205117A project FG3 beginning in FY 2018.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 1206308A / Army Space Systems Integration				Project (Number/Name) FE5 / Space And Missile Defense Integration			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
FE5: Space And Missile Defense Integration	-	0.000	0.000	15.966	-	15.966	18.165	17.551	20.680	21.187	0.000	93.549
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

PE 0603308A project 990 transition to PE 1206308A project FE5 beginning in FY 2018.

A. Mission Description and Budget Item Justification

- PE 0603308A project 990 transition to PE 1206308A project FE5 beginning in FY 2018.

USASMDC/ARSTRAT: Headquarters, Department of the Army General Order 37, dated 16 October 2006, designated USASMDC/ARSTRAT as the Army proponent for space and ground-based midcourse defense (GBMD), the Army integrator for global missile defense (GMD), and the Army Service Component Command (ASCC) of the U.S. Strategic Command (USSTRATCOM). Army Regulation (AR) 10-87, Army Commands, Army Service Component Commands, and Direct Reporting Units, dated 4 September 2007, and AR 5-22, The Army Force Modernization Proponent System, dated 19 August 2009, designate USASMDC/ARSTRAT as the Army specified proponent for Global Missile Defense and Space/High Altitude capabilities. As the Army proponent for space, high altitude and GBMD, USASMDC/ARSTRAT is responsible for developing warfighting concepts, conduct warfighting experiments to validate those concepts, identify capabilities needed to implement the validated concepts, and develop Doctrine, Organizations, Training, Material, Leadership & Education, Personnel, Facilities and Policy (DOTMLPF-P) solutions to realize the GMD capabilities. As the Army integrator for global missile defense, USASMDC/ARSTRAT is responsible for reviewing programs managed by the Army, other Services, Defense agencies and National agencies to ensure that they are correctly synchronized and will ultimately provide the capabilities required by USSTRATCOM to execute its global missile defense responsibilities.

Project FE5 funds United States Army Space and Missile Command/Army Strategic Command (USASMDC/ARSTRAT) efforts to develop, analyze and mature warfighting concepts, and conduct warfighting experiments for space and high altitude capabilities. USASMDC/ARSTRAT is the proponent for space / high altitude capabilities and is responsible for determining and integrating Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel and Facilities (DOTMLPF-P) for the Army. The program also funds development and integration of new data sources and data services into the Joint Friendly Force Tracking Mission Management Center. The Mission Management Center (MMC) injects real-time Joint Friendly Force Tracking (J-FFT) information into the Common Operating Picture for Combatant Commands (COCOMs), Joint Task Forces (JTFs) and Coalition partners. USSTRATCOM, in accordance with CJCSI 3910.01 (reference V.4.) is designated one of three coordinating agencies for J-FFT within DOD. CJCSI 3910.01 directs eight Force Modernization tasks to USSTRATCOM. USSTRATCOM SI 534-5 (reference V.6.) and annually published USSTRATCOM operations orders have designated USASMDC/ARSTRAT as the lead USSTRATCOM component command for J-FFT.

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

	FY 2016	FY 2017	FY 2018
Title: : Architecture Development, Wargames and Demonstrations	-	-	13.016

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 1206308A / Army Space Systems Integration	Project (Number/Name) FE5 / Space And Missile Defense Integration		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Description: Funding is provided for the following efforts</p> <p>FY 2018 Plans: Plan, develop, and execute architectures and combat development solutions for Army integration of space systems, space control capabilities, missile defense and high altitude systems. Represent Army positions and defend Army equities relative to space and high altitude domains in Joint/DoD and inter-Service activities; e.g., Executive Agent for Space Program Assessments, etc. Plan and execute wargames to evaluate emerging concepts within the space and high altitude domains as well as participate and provide support to Army and Joint wargames and experiments where space and high altitude capabilities and technologies can be integrated and evaluated in the most realistic operating environment possible. Ensure that space, high altitude and cyber capability gaps are identified and capabilities are correctly represented so that the Army's use of these capabilities is explored and where possible, exploited. Develop space modernization strategies and sponsor exploration of future space and high altitude warfighting concepts. USASMDC/ARSTRAT will continue efforts to enhance the resiliency and effectiveness of critical space-based assets and JCIDS capability development activities for space superiority, high altitude persistent platforms, nano-satellites and tactical launch systems. Products scheduled to be delivered in FY18 include Army Cyberspace Analysis; Space Superiority Analysis of Alternatives and Cost -Benefit Analysis updates: Overhead Persistence Infrared (OPIR) Analysis; Assessment of Hostile use of Space Force Enhancement; and Position Navigation Timing (PNT) analysis. Support TAA 21-25 Resourcing Phase and commence TAA 22-26 Capability Demand Analysis Phase. TAA is a phased force structure analysis process that defines the required Army force structure within end strength and accounts for the military and DA Civilian requirements and authorizations necessary to comply with DOD guidance. Participate in the Army's FDU process 19-2 and 20-1. FDUs Include capabilities development, capabilities determination, requirements approval, and implementation decisions. Additionally during the TAA cycle new Rules of Allocation (ROA) will be developed to ensure SRC40 units are properly accounted for in the future POM force.</p>				
<p>Title: Joint Friendly Force Tracking (J-FFT) Testbed</p> <p>Description: Funding is provided for the following efforts</p> <p>FY 2018 Plans: Support the full integration of Joint Friendly Force Tracking (J-FFT) into Combat Commanders' friendly force tracking requirements. Continue to develop the J-FFT Testbed for its use in integrating hardware and software prior to its deployment to the field. Leverage network enabled command and control system enhancements and continue to support development of Friendly Force Tracking (FFT) capabilities for deployed and coalition forces. Continue to transition Force Tracking Advanced Management System (FTAMS) to FFT-Mission Management Center (MMC). The J-FFT Division coordinates and executes USSTRATCOM-directed FFT tasks in order to assure continuous 24/7 FFT data services support to authorized users to include</p>		-	-	2.950

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 1206308A / <i>Army Space Systems Integration</i>	Project (Number/Name) FE5 / <i>Space And Missile Defense Integration</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
the Combatant Commands, the Services, agencies, allies, and coalition partners in order to improve their situational awareness (SA), enhance command and control (C2) to reduce fratricide in combat, homeland defense, civil and contingency operations.				
Accomplishments/Planned Programs Subtotals		-	-	15.966
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
N/A				
D. Acquisition Strategy				
N/A				
E. Performance Metrics				
N/A				

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 1206308A / Army Space Systems Integration	Project (Number/Name) FE5 / Space And Missile Defense Integration
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Management Services (\$ in Millions)				FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 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 Category Item Name	TBD	TBD : TBD	0.000	-		-		15.966		-		15.966	0.000	15.966	0.000
Subtotal			0.000	-		-		15.966		-		15.966	0.000	15.966	0.000

Remarks
N/A

	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-	0.000	15.966	-	15.966	0.000	15.966	0.000

Remarks

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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 1206308A / Army Space Systems Integration	Project (Number/Name) FE5 / Space And Missile Defense Integration
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Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022							
	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				
Provide 24/7 support to Friendly Force Tracking.																																
Jericho Thunder Analysis Support																																
SMDC NanoSat Analysis (SNAP, KE)																																
Space Superiority Joint Architecture Analysis																																
Force Design Assessment of Army Forces																																
NAVWAR/PNT in a Denied Environment																																
Implications of the Emerging "Third" Offset Strategy for SMDC Space																																
Space Simulation Support to TRADOC ARCIC Experimentation																																
Common Ground Station Operating Concept and Requirement Document																																
NAVWAR Characterization Operating Concept and Requirements Document																																
JFFT Capability Development Document																																
High Altitude Persistent Platform Initial or Capability Development Document																																

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 1206308A / Army Space Systems Integration	Project (Number/Name) FE5 / Space And Missile Defense Integration

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Provide 24/7 support to Friendly Force Tracking.	1	2019	4	2022
Jericho Thunder Analysis Support	1	2019	4	2022
SMDC NanoSat Analysis (SNAP, KE)	1	2019	4	2022
Space Superiority Joint Architecture Analysis	1	2019	4	2022
Force Design Assessment of Army Forces	1	2019	4	2022
NAVWAR/PNT in a Denied Environment	1	2019	2	2022
Implications of the Emerging "Third" Offset Strategy for SMDC Space	1	2019	2	2019
Space Simulation Support to TRADOC ARCIC Experimentation	1	2019	4	2022
Common Ground Station Operating Concept and Requirement Document	1	2019	3	2019
NAVWAR Characterization Operating Concept and Requirements Document	1	2017	2	2020
JFFT Capability Development Document	1	2019	2	2019
High Altitude Persistent Platform Initial or Capability Development Document	1	2019	3	2019

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 4					R-1 Program Element (Number/Name) PE 1206308A / Army Space Systems Integration				Project (Number/Name) FE6 / Army Space System Enhancement/ Integration			
COST (\$ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
FE6: Army Space System Enhancement/Integration	-	0.000	0.000	4.466	-	4.466	5.962	5.082	0.361	22.682	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding transferred from PE 0603308A project EB7 transition to PE 1206308A project FE6 and PE 1205117A project FG3 beginning in FY 2018.

A. Mission Description and Budget Item Justification

The details of this program are reported in accordance with Title 10, United States Code, Section 119(a)(1).

Funding line is shared between USA Space and Missile Defense Command (SMDC) and Program Executive Office Intelligence, Electronic Warfare and Sensors (PEO IEW&S) starting in FY2018. Funding transferred from PE 0603308A project EB7 transition to PE 1206308A project FE6 and PE 1205117A project FG3 beginning in FY 2018.

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

	FY 2016	FY 2017	FY 2018
Title: Details of this program are reported in accordance with Title 10	-	-	4.466
Description: Details of this program are reported in accordance with Title 10, United States Code, Section 119 (a)(1).			
FY 2018 Plans: Details of this program are reported in accordance with Title 10, United States Code, Section 119 (a)(1).			
Accomplishments/Planned Programs Subtotals	-	-	4.466

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

Line Item	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
• TBD: start	-	-	-	-	-	-	-	-	-	0	0.000

Remarks

Details of this program are reported in accordance with Title 10, United States Code, Section 119 (a)(1).

D. Acquisition Strategy

Details of this program are reported in accordance with Title 10, United States Code, Section 119 (a)(1).

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 4	R-1 Program Element (Number/Name) PE 1206308A / <i>Army Space Systems Integration</i>	Project (Number/Name) FE6 / <i>Army Space System Enhancement/ Integration</i>

<u>E. Performance Metrics</u> N/A

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