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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 5A

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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
 FY 2018 President's Budget Request
 Exhibit R-1 FY 2018 President's Budget Request
 Total Obligational Authority
 (Dollars in Thousands)

26 Apr 2017

Appropriation	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
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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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
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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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26 Apr 2017

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	FY 2017	FY 2017	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	S e c
				Total PB Requests** with CR Adj Base+OCO+SAA	Total PB Requests* with CR Adj Base + OCO	Less Enacted Div B P.L.114-254** OCO	Remaining Req with CR Adj Base + OCO				
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

R-1C1F: FY 2018 President's Budget Request (Published Version), as of April 26, 2017 at 08:46:19

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26 Apr 2017

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
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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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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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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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604201A / <i>Aircraft Avionics</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	-	18.194	83.248	30.153	-	30.153	76.576	11.780	28.502	14.706	Continuing	Continuing
C97: <i>ACFT Avionics</i>	-	1.821	0.798	20.915	-	20.915	16.807	7.149	5.768	5.407	Continuing	Continuing
EW7: <i>Degraded Visual Environment</i>	-	0.000	0.000	8.272	-	8.272	58.800	4.450	22.545	7.803	Continuing	Continuing
VU3: <i>Networking And Mission Planning</i>	-	16.373	82.450	0.966	-	0.966	0.969	0.181	0.189	1.496	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Fiscal Year (FY) 2018 budget request funds the development of Aircraft Avionics systems required to horizontally and vertically integrate the battlefield and the integration of those systems into Army aircraft. Tasks in this Program Element support research, development, and test efforts in the Engineering and Manufacturing Development phases of these systems.

The Airborne Maritime Fixed-Aviation (AMF-A) is the transformational system that provides Army Aviation interoperability capability for Future Force and Joint Force operations. The AMF-A integration effort provides for the non-recurring engineering required to integrate and qualify the AMF-A certified radios with Link 16 and/or other advanced networking waveforms into the Apache AH-64E and Unmanned Aircraft Systems (UAS). Specifically, the PRC-152A radio will be incorporated into the Shadow UAS Communications Relay Payload mission equipment package.

The Doppler Global Positioning System Navigation Set (DGNS) Upgrade program completes system engineering trade studies to reduce space, weight, and power with the introduction of new navigation support capabilities such as inertial sensor, MIL-STD-1553 interface card, and Instrument Flight Rules map display. It also prepares Engineering Change Proposals (ECP) to the existing DGNS ASN-128D Line Replaceable Units (LRU) as a result of those trade studies. The DGNS upgrade continues with execution of Non-Recurring Engineering for Computer Display Unit (CDU) and Signal Data Converter LRU ECP packages. The ASN-128D CDU upgrade replaces the current CDU faceplate with a touch screen display, provides a moving navigation map capability and optimizes pilot interface to augment existing Instrument Flight Rules capability promoting safer flight operations. The CDU upgrade will support Assured-Position Navigation and Timing (A-PNT) operations in conjunction with additional system LRU upgrades, includes anti-jam antenna capabilities, and supports Department of Defense (DoD) and Army's requirement to maintain A-PNT throughout operations. This will require assessment and follow-on upgrade to the DGNS navigation system. The CDU upgrade will perform an assessment of A-PNT assurance levels to understand system performance and associated PNT capability gaps, and will evaluate candidate solutions to cover any identified gaps.

The Enhanced Aviation GATM Localizer Performance with Vertical Guidance (LPV) Embedded GPS Inertial (EGI) Navigation System (EAGLE) A-PNT integration program assesses current capabilities in identified operational PNT environment levels, tests identified upgrades to existing EGI hardware in order to accommodate A-PNT in identified operational environments, and incorporates M-Code. It supports DoD and Army's requirement to maintain A-PNT throughout operations and requires assessment and follow-on upgrade to the EGI navigation system. The EAGLE upgrade will perform an assessment of A-PNT assurance levels to understand system performance, associated PNT capability gaps, integrate anti-jam antenna capabilities, and evaluate candidate solutions to cover any identified gaps.

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604201A / <i>Aircraft Avionics</i>
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The Degraded Visual Environment/Brownout Rotorcraft Enhancement System (DVE/BORES) program increases survivability for both tactical operations and training missions within the Degraded Visual Environment which severely reduces or eliminates the aircrew's visibility due to atmospheric obscurants. DVE/BORES will combine obscurant penetrating sensor(s) with aircraft state data, via a fusion/synthetic vision system, to provide an initial capability for ground taxi, hover, takeoff and landing modes of flight during brownout conditions. DVE/BORES will improve safety, reduce risk and add flexibility to aviation units by enhancing aircrew awareness through real-time detection and warning of terrain, obstacles and hazards. DVE/BORES will consist of integrated rotorcraft pilotage sensor(s), software, software related firmware, and pilot to system interfaces and cueing.

The Aviation Data Exploitation Capability (ADEC) is an Army aviation automated information system program providing specific capabilities needed at the aviation unit level to implement and support improvements within aviation operations, safety, and training to increase operational effectiveness and situational awareness at all command echelons. ADEC provides a common and interoperable capability required to implement the DoD mandated Military Flight Operations Quality Assurance processes. ADEC will standardize flight scheduling/management, risk management, mission approval, and flight data analysis and visualization. ADEC provides interfaces to Centralized Aviation Flight Records System (CAFRS) to reduce data entry and the information technology footprint while enabling disconnected and split based operations.

The Improved Data Modem (IDM) provides digital connectivity among airborne and ground platforms and transmission of air-to-air target data between IDM equipped aircraft using existing radio and crypto equipment. IDM new software architecture will incorporate the ability to host IDM functionality on hardware that meets the minimum requirements to run the IDM Operating Flight Program. These efforts will include development and testing of that capability, as well as any documentation required to ensure Government Purpose rights to the new software.

The FY 2018 funding request was reduced by \$7.397 million to account for the availability of prior year execution balances.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	18.639	83.248	90.386	-	90.386
Current President's Budget	18.194	83.248	30.153	-	30.153
Total Adjustments	-0.445	0.000	-60.233	-	-60.233
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.445	-			
• Adjustments to Budget Years	0.000	0.000	-60.233	-	-60.233

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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 5: System Development & Demonstration (SDD)*

R-1 Program Element (Number/Name)
PE 0604201A / *Aircraft Avionics*

Change Summary Explanation

FY18 reflects multiple adjustments to funding as follows: HQDA realignments to other programs (-\$67.420 million), A-PNT increase (\$15.086 million), under-execution (-\$7.397 million), inflation (-\$0.502 million).

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604201A / Aircraft Avionics				Project (Number/Name) C97 / ACFT Avionics			
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
C97: ACFT Avionics	-	1.821	0.798	20.915	-	20.915	16.807	7.149	5.768	5.407	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Fiscal Year (FY) 2018 budget request funds the development of Aircraft Avionics systems required to horizontally and vertically integrate the battlefield and the integration of those systems into Army aircraft. Tasks in this Project support research, development, and test efforts in the Engineering and Manufacturing Development phases of these systems.

The Airborne Maritime Fixed-Aviation (AMF-A) is the transformational system that provides Army Aviation interoperability capability for Future Force and Joint Force operations. The AMF-A integration effort provides for the non-recurring engineering required to integrate and qualify the AMF-A certified radios with Link 16 and/or other advanced networking waveforms into the Apache AH-64E and Unmanned Aircraft Systems (UAS). Specifically, the PRC-152A radio will be incorporated into the Shadow UAS Communications Relay Payload mission equipment package.

The Doppler Global Positioning System Navigation Set (DGNS) Upgrade program completes system engineering trade studies to reduce space, weight, and power with the introduction of new navigation support capabilities such as inertial sensor, MIL-STD-1553 interface card, and Instrument Flight Rules map display. It also prepares Engineering Change Proposals (ECP) to the existing DGNS ASN-128D Line Replaceable Units (LRU) as a result of those trade studies. The DGNS upgrade continues with execution of Non-Recurring Engineering for Computer Display Unit (CDU) and Signal Data Converter LRU ECP packages. The ASN-128D CDU upgrade replaces the current CDU faceplate with a touch screen display, provides a moving navigation map capability and optimizes pilot interface to augment existing Instrument Flight Rules capability promoting safer flight operations. The CDU upgrade will support Assured-Position Navigation and Timing (A-PNT) operations in conjunction with additional system LRU upgrades, includes anti-jam antenna capabilities, and supports Department of Defense (DoD) and Army's requirement to maintain A-PNT throughout operations. This will require assessment and follow-on upgrade to the DGNS navigation system. The CDU upgrade will perform an assessment of A-PNT assurance levels to understand system performance and associated PNT capability gaps, and will evaluate candidate solutions to cover any identified gaps.

The Enhanced Aviation GATM Localizer Performance with Vertical Guidance (LPV) Embedded Global Positioning System (GPS) Inertial (EGI) Navigation System (EAGLE) A-PNT integration program assesses current capabilities in identified operational PNT environment levels, tests identified upgrades to existing EGI hardware in order to accommodate A-PNT in identified operational environments, and incorporates M-Code. It supports DoD and Army's requirement to maintain A-PNT throughout operations and requires assessment and follow-on upgrade to the EGI navigation system. The EAGLE upgrade will perform an assessment of A-PNT assurance levels to understand system performance, associated PNT capability gaps, integrate anti-jam antenna capabilities, and evaluate candidate solutions to cover any identified gaps.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / Aircraft Avionics	Project (Number/Name) C97 / ACFT Avionics
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Title: Airborne Maritime Fixed (AMF-A) integration and qualification for Apache AH-64E and PRC-152A Radio for UAS platforms.</p> <p>Description: The AMF-A integration effort provides for the non-recurring engineering required to integrate and qualify the PRC-152A compliant radios and/or other advanced networking waveforms into the Apache AH-64E and UAS platforms for both production cut-in and retrofit activities.</p> <p>FY 2016 Accomplishments: Continued development of AMF-A antennas and associated Co-Site Analysis tasks.</p> <p>FY 2017 Plans: Complete catalogue development of AMF-A antennas and associated Co-Site Analysis tasks.</p>	0.676	0.050	-	-	-
<p>Title: Doppler Global Positioning System Navigation Set (DGNS) Upgrade/Assured-Position Navigation and Timing (A-PNT) Assessment</p> <p>Description: The DGNS Upgrade program completes system engineering trade studies to reduce space, weight, and power with the introduction of new navigation support capabilities such as inertial sensor, MIL-STD-1553 interface card, and Instrument Flight Rules (IFR) map display. It also prepares ECPs to the existing DGNS ASN-128D LRU as a result of those trade studies. The DGNS upgrade continues with execution of Non-Recurring Engineering for CDU and Signal Data Converter LRU ECP packages. The ASN-128D CDU Upgrade replaces the current CDU faceplate with a touch screen display, provides a moving navigation map capability and optimized pilot interface to augment existing IFR capability and promote safer flight operations. It also enables CDU support for A-PNT operations in conjunction with additional system LRU upgrades, including anti-jam antenna capabilities.</p> <p>FY 2016 Accomplishments: Completed Computer Display Unit upgrade hardware Critical Design Review (CDR)</p> <p>FY 2017 Plans: Complete assessments and feasibility studies performed on the CDU Upgrade equipment to identify hardware and software changes required to meet A-PNT requirements.</p> <p>FY 2018 Base Plans: Complete assessments and feasibility studies performed on the DGNS CDU to determine upgrades needed to meet A-PNT requirements and begin executing hardware and software upgrades identified in the completed</p>	1.145	0.200	6.310	-	6.310

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / Aircraft Avionics	Project (Number/Name) C97 / ACFT Avionics

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
assessment. Continues software modifications to legacy GPS receiver cards to include Resiliency Software Assurance Modification (RSAM) and continues GPS Anti-jam Antenna development.					
Title: Enhanced Aviation GATM Localizer Performance with Vertical Guidance (LPV) Embedded GPS Inertial (EGI) Navigation System (EAGLE) Description: The EAGLE Navigation System A-PNT integration program assesses current capabilities in identified operational PNT environment levels and tests identified upgrades to existing EGI hardware to accommodate A-PNT in identified operational environments. FY 2017 Plans: Initiate assessments and feasibility studies on the current EGI and EAGLE equipment to identify hardware and software changes required to meet A-PNT requirements and to incorporate M-Code. FY 2018 Base Plans: Complete assessments and feasibility studies performed on the EGI and EAGLE equipment, determine upgrades needed to meet A-PNT requirements, begin executing hardware and software upgrades identified in the completed assessment, and begin to incorporate M-Code. Continues software modifications to legacy GPS receiver cards to include Resiliency Software Assurance Modification (RSAM) and continues GPS Anti-jam Antenna development.	-	0.548	14.605	-	14.605
Accomplishments/Planned Programs Subtotals	1.821	0.798	20.915	-	20.915

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>
• AA0723: COMMS, NAV Surveillance	82.904	69.960	166.050	4.289	170.339	130.750	138.892	131.701	142.924	Continuing	Continuing
• AA0704: GATM Rotary Wing	33.890	45.302	37.403	-	37.403	29.808	42.915	29.380	13.484	Continuing	Continuing

Remarks

D. Acquisition Strategy

This project is comprised of multiple systems supporting aircraft avionics. While the detailed acquisition strategy varies from program to program, the general strategy is for each individual program to complete the development and testing efforts in coordination with the aircraft platforms on integration issues, use the various contracts of the aircraft platforms original equipment manufacturers on integration efforts, and utilize the Aviation & Missile Research, Development, and Engineering Center for

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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 / 5	PE 0604201A / Aircraft Avionics	C97 / ACFT Avionics

software development. This requires the use of various contract methods and types to accomplish the aircraft avionics development efforts. All required acquisition program documentation is prepared.

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 / 5	R-1 Program Element (Number/Name) PE 0604201A / Aircraft Avionics	Project (Number/Name) C97 / ACFT Avionics
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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			
PM Services (EAGLE)	Various	PM AME/AMRDEC SED : Redstone Arsenal, AL	0.000	-		0.200	Oct 2016	0.583	Oct 2017	-		0.583	Continuing	Continuing	Continuing
PM Services (DGNS Upgrade/ DGNS A-PNT)	Various	PM AME/AMRDEC SED : Redstone Arsenal, AL	0.063	0.556	Oct 2016	-		0.577	Oct 2017	-		0.577	Continuing	Continuing	Continuing
PM Services (AMF-A)	Various	PM AME : Redstone Arsenal, AL	1.863	0.676	Oct 2015	-		-		-		-	0.000	2.539	0.000
Subtotal			1.926	1.232		0.200		1.160		-		1.160	-	-	-

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			
AMF-A Antenna Development and Co-Site Analysis	Various	AMRDEC, Prototype Integration Facility/ CERDEC Flight Activity : Redstone Arsenal, AL/ Lakehurst, NJ	4.134	-		0.050	Mar 2017	-		-		-	0.000	4.184	0.000
DGNS A-PNT Assessment and Upgrade	SS/CPFF	BAE Systems : Wayne, NJ	0.000	-		0.200	Feb 2017	5.527	Feb 2018	-		5.527	Continuing	Continuing	Continuing
EGI/EAGLE A-PNT Assessment and Upgrade/ M-Code Integration	SS/CPFF	Honeywell : Clearwater, FL	0.000	-		0.348	Feb 2017	14.028	Feb 2018	-		14.028	Continuing	Continuing	Continuing
DGNS/EGI Anti-Jam Antenna Development	SS/CPFF	Mayflower : Bedford, MA	0.000	0.589	Sep 2016	-		0.200	Jan 2018	-		0.200	Continuing	Continuing	Continuing
Subtotal			4.134	0.589		0.598		19.755		-		19.755	-	-	-

	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		6.060	1.821	0.798	20.915	-	-	20.915	-

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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 / 5	R-1 Program Element (Number/Name) PE 0604201A / <i>Aircraft Avionics</i>	Project (Number/Name) C97 / <i>ACFT Avionics</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 / 5	R-1 Program Element (Number/Name) PE 0604201A / Aircraft Avionics	Project (Number/Name) C97 / ACFT Avionics
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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
DGNS AN/ASN-128D A-PNT Assessment and Upgrade																												
EGI/EAGLE A-PNT Assessment and Upgrade/ M-Code Integration																												
AMF-A Antenna Development and Co-Site Analysis																												
DGNS/EGI Anti-Jam Antenna Development																												
DGNS/EGI Anti-Jam Antenna Development (cont'd)																												

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / Aircraft Avionics	Project (Number/Name) C97 / ACFT Avionics
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
DGNS AN/ASN-128D A-PNT Assessment and Upgrade	1	2017	4	2020
EGI/EAGLE A-PNT Assessment and Upgrade/ M-Code Integration	2	2017	2	2021
AMF-A Antenna Development and Co-Site Analysis	2	2011	4	2017
DGNS/EGI Anti-Jam Antenna Development	4	2016	4	2017
DGNS/EGI Anti-Jam Antenna Development (cont'd)	2	2018	2	2019

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / Aircraft Avionics	Project (Number/Name) EW7 / Degraded Visual Environment
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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
EW7: <i>Degraded Visual Environment</i>	-	0.000	0.000	8.272	-	8.272	58.800	4.450	22.545	7.803	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding for the Degraded Visual Environment/Brownout Rotorcraft Enhancement System (DVE/BORES) program was previously included in PE 0604201A, Aircraft Avionics/Project VU3, Networking and Mission Planning.

A. Mission Description and Budget Item Justification

The Fiscal Year (FY) 2018 budget request funds the development, system testing, integration and installation of the DVE/BORES on Army aircraft to support qualification and operational test events.

The DVE/BORES program increases survivability for both tactical operations and training missions within the Degraded Visual Environment which severely reduces or eliminates the aircrew's visibility due to atmospheric obscurants. DVE/BORES will combine obscurant penetrating sensor(s) with aircraft state data, via a fusion/synthetic vision system, to provide an initial capability for takeoff and landing modes of flight during brownout conditions. DVE/BORES will improve safety, reduce risk and add flexibility to aviation units by enhancing aircrew awareness through real-time detection and warning of terrain, obstacles and hazards. DVE/BORES will consist of rotorcraft sensor(s), software, software related firmware, and pilot to system interfaces and cueing.

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

Title: DVE/BORES

Description: The DVE/BORES program increases survivability for both tactical operations and training missions within the Degraded Visual Environment which severely reduces or eliminates the aircrew's visibility due to atmospheric obscurants. DVE/BORES will combine obscurant penetrating sensor(s) with aircraft state data, via a fusion/synthetic vision system, to provide an initial capability for takeoff and landing modes of flight during brownout conditions. DVE/BORES will improve safety, reduce risk and add flexibility to aviation units by enhancing aircrew awareness through real-time detection and warning of terrain, obstacles and hazards. DVE/BORES will consist of rotorcraft sensor(s), software, software related firmware, and pilot to system interfaces and cueing.

FY 2018 Base Plans:

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
	-	-	8.272	-	8.272

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / Aircraft Avionics	Project (Number/Name) EW7 / Degraded Visual Environment
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Develop program documentation, perform system modeling and simulation activities, and continue the development of integration Modification Work Order procedures for hardware integration onto the UH/HH-60M and CH-47F.					
Accomplishments/Planned Programs Subtotals	-	-	8.272	-	8.272

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>
• A00713: Degraded Visual Environmnet	-	-	-	-	-	-	56.082	59.171	181.774	Continuing	Continuing

Remarks

D. Acquisition Strategy
DVE's acquisition strategy is to use the various contracts of the aircraft platforms original equipment manufacturers on integration efforts, use the TAPO competitive contract for development, testing, and qualification of hardware and software for the DVE/BORES program, and utilize the Aviation & Missile Research, Development, and Engineering Center for software development. Integration will be done in coordination with the aircraft platforms, PM offices, and their OEMs. This requires the use of various contract methods and types to accomplish the DVE development efforts.

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 / 5	R-1 Program Element (Number/Name) PE 0604201A / Aircraft Avionics	Project (Number/Name) VU3 / Networking And Mission Planning
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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
VU3: <i>Networking And Mission Planning</i>	-	16.373	82.450	0.966	-	0.966	0.969	0.181	0.189	1.496	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding for the Degraded Visual Environment/Brownout Rotorcraft Enhancement System (DVE/BORES) program has been moved to PE 0604201A, Aircraft Avionics/ Project EW7, Degraded Visual Environment, beginning in FY18.

A. Mission Description and Budget Item Justification

The Fiscal Year (FY) 2018 budget request funds the development of Networking and Mission Planning systems required to horizontally and vertically integrate the battlefield and the integration of those systems into Army aircraft. Tasks in this Project support research, development, and test efforts in the Engineering and Manufacturing Development (EMD) phases of these systems.

The DVE/BORES program increases survivability for both tactical operations and training missions within the Degraded Visual Environment which severely reduces or eliminates the aircrew's visibility due to atmospheric obscurants. DVE/BORES will combine obscurant penetrating sensor(s) with aircraft state data, via a fusion/ synthetic vision system, to provide an initial capability for takeoff and landing modes of flight during brownout conditions. DVE/BORES will improve safety, reduce risk and add flexibility to aviation units by enhancing aircrew awareness through real-time detection and warning of terrain, obstacles and hazards. DVE/BORES will consist of rotorcraft sensor(s), software, software related firmware, and pilot to system interfaces and cueing.

The Aviation Data Exploitation Capability (ADEC) is an Army aviation automated information system program providing specific capabilities needed at the aviation unit level to implement and support improvements within aviation operations, safety, and training to increase operational effectiveness and situational awareness at all command echelons. ADEC provides a common and interoperable capability required to implement the DoD mandated Military Flight Operations Quality Assurance processes. ADEC will standardize flight scheduling/management, risk management, mission approval, and flight data analysis and visualization. ADEC provides interfaces to Centralized Aviation Flight Records System (CAFRS) to reduce data entry and the information technology footprint while enabling disconnected and split based operations.

The Improved Data Modem (IDM) provides digital connectivity among airborne and ground platforms and transmission of air-to-air target data between IDM equipped aircraft using existing radio and crypto equipment. IDM new software architecture will incorporate the ability to host IDM functionality on hardware that meets the minimum requirements to run the IDM Operating Flight Program. These efforts will include development and testing of that capability, as well as any documentation required to ensure Government Purpose rights to the new software.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: DVE/BORES	14.636	80.541	-	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604201A / Aircraft Avionics	Project (Number/Name) VU3 / Networking And Mission Planning

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Description: The DVE/BORES program increases survivability for both tactical operations and training missions within the Degraded Visual Environment which severely reduces or eliminates the aircrew's visibility due to atmospheric obscurants. DVE/BORES will combine obscurant penetrating sensor(s) with aircraft state data, via a fusion/synthetic vision system, to provide an initial capability for takeoff and landing modes of flight during brownout conditions. DVE/BORES will improve safety, reduce risk and add flexibility to aviation units by enhancing aircrew awareness through real-time detection and warning of terrain, obstacles and hazards. DVE/BORES will consist of rotorcraft sensor(s), software, software related firmware, and pilot to system interfaces and cueing.</p> <p>FY 2016 Accomplishments: Identified an existing developmental system as the material solution and continued the development of an Airworthiness Qualification Package. Initiated airworthiness software development to meet airworthiness Design Assurance Levels, prepared program documentation, conducted modeling and simulation activities, and analyses to integrate the material solution onto the Utility Helicopter (UH/HH-60M) and Cargo Helicopter (CH-47F) aircraft.</p> <p>FY 2017 Plans: Continue the design and develop the technical system and sub-system specifications for the DVE/BORES. The DVE/BORES program will identify airworthiness requirements for hardware and software, complete identified aircraft trade studies with original equipment manufacturers, continue the development of program documentation, and initiate modeling and simulation as risk reduction activities. Program efforts include the issuance of a contract request for proposal with subsequent source selection evaluation of proposals.</p> <p>Title: Aviation Data Exploitation Capability (ADEC)</p>					
<p>Description: The ADEC is an Army aviation automated information system program providing specific capabilities needed at the aviation unit level to implement and support improvements within aviation operations, safety, and training to increase operational effectiveness and situational awareness at all command echelons. ADEC provides a common and interoperable capability required to implement the DoD mandated Military Flight Operations Quality Assurance processes. ADEC will standardize flight scheduling/management, risk management, mission approval, and flight data analysis and visualization. ADEC provides interfaces to CAFRS to reduce data entry and the information technology footprint while enabling disconnected and split based operations.</p> <p>FY 2016 Accomplishments:</p>	1.737	1.909	-	-	-

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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 / 5	R-1 Program Element (Number/Name) PE 0604201A / Aircraft Avionics	Project (Number/Name) VU3 / Networking And Mission Planning
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continued ADEC design, development, integration, and developmental testing of software version 2.0.					
FY 2017 Plans: Complete ADEC development, integration, and developmental and operational testing of software version 2.0.					
Title: Improved Data Modem	-	-	0.966	-	0.966
FY 2018 Base Plans: Develop new software architecture that will incorporate the ability to host IDM functionality on any hardware that meets the minimum requirements to run the IDM Operating Flight Program. Efforts include the development and testing of that capability, as well as any documentation required to ensure Government Purpose rights to the new software.					
Accomplishments/Planned Programs Subtotals	16.373	82.450	0.966	-	0.966

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
• AA0712: Network and Mission Plan	108.807	74.752	142.102	-	142.102	143.561	119.839	134.046	98.969	Continuing	Continuing

Remarks

D. Acquisition Strategy
This project is comprised of multiple systems supporting aircraft avionics. While the detailed acquisition strategy varies from program to program, the general strategy is for each individual program to complete the development and testing efforts in coordination with the aircraft platforms on integration issues, use the various contracts of the aircraft platforms original equipment manufacturers on integration efforts, use the TAPO competitive contract for development, testing, and qualification of hardware and software for the DVE/BORES program, and utilize the Aviation & Missile Research, Development, and Engineering Center for software development. This requires the use of various contract methods and types to accomplish the aircraft avionics development efforts.

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 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604270A / Electronic Warfare Development
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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	-	20.586	37.242	71.671	-	71.671	81.511	80.623	65.807	50.466	Continuing	Continuing
DX5: <i>Electronic Warfare And Management Tool</i>	-	10.739	19.440	33.120	-	33.120	20.475	18.908	11.214	18.278	Continuing	Continuing
DX6: <i>Multi-Function Electronic Warfare (MFEW)</i>	-	0.000	3.969	24.310	-	24.310	46.738	48.943	42.257	23.617	Continuing	Continuing
ET7: <i>Radio Frequency Interference Mitigation</i>	-	0.000	4.151	4.454	-	4.454	4.356	2.674	2.079	3.000	Continuing	Continuing
VS6: <i>Integrated Electronic Warfare Systems</i>	-	9.847	9.682	9.787	-	9.787	9.942	10.098	10.257	5.571	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element (PE) encompasses engineering and manufacturing development for tactical Electronic Warfare (EW). The Integrated Electronic Warfare System (IEWS) is a system of systems capability set that integrates electronic attack, protect and support functions to dramatically improve the ability to seize, retain, and exploit an advantage within the electromagnetic spectrum (EMS). It is based on a modular, scalable and open architecture to allow Army Brigade Combat Team (BCT) and Joint Force Commander's to tailor capability responses against a variety of EW threats/scenarios.

The IEWS capability set is structured along four program lines of effort: 1) Project DX5 Electronic Warfare Planning and Management Tools (EWPMT), 2) Project DX6 Multi-Function EW (MFEW), 3) Project VS6 Counter Radio-Controlled Improvised Explosive Devices (RCIED) Electronic Warfare (CREW) which provides current defensive electronic attack capability, and 4) Project ET7 Radio Frequency Interference Mitigation (RIM) which resolves radio frequency interference and electromagnetic fratricide and enables electronic warfare and communications compatibility.

Project DX5 - EWPMT will provide the Electronic Warfare Officer (EWO) planning capabilities to coordinate, manage, and deconflict the use of the Electromagnetic Spectrum and synchronize spectrum operations within the Cyber Electromagnetic Activities (CEMA) cell. EWPMT will integrate data elements from Mission Command, Intelligence, and Fires to achieve a Common Operating Picture (COP) of the Electromagnetic Operational Environment.

Project DX6 - The Multi-Function EW (MFEW) is a System of Systems that will provide the BCT Commander with an organic airborne and ground offensive Electronic Attack (EA) and Electronic Warfare Support (ES) capability. MFEW-Air and MFEW-Ground variants empower Commanders to shape the Electromagnetic Spectrum (EMS) to their advantage. MFEW will provide commanders from BCT to CORPS with an organic EW capability that dramatically improves a land force's ability to seize, retain, and exploit an advantage within the EMS in order to execute successful unified land operations. These capabilities give the commander a competitive advantage by denying, degrading the enemy's ability to conduct Command and Control (C2), Intelligence, Surveillance and Reconnaissance (ISR), and targeting; and allows the commander to optimize effects within the EMS at the time and place of their choosing. These systems are networked with the Electronic Warfare Planning and Management Tool (EWPMT) to allow remote operation and dynamic tasking/reprogramming.

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>
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Project ET7 – Radio Frequency Interference Mitigation (RIM) is a cross cutting capability to centrally manage and provide oversight to identify, define, test, and coordinate development of Radio Frequency (RF) interference mitigation material solutions to resolve mutual RF interference and electromagnetic fratricide for Spectrum Dependent Systems (SDS).

Project VS6 - Counter Radio Controlled Improvised Explosive Device (RCIED) Electronic Warfare (CREW) provides for protection for ground forces operating in vehicle convoys, single vehicle operations and fixed locations in all theatres of operations. It is programmable to migrate with the evolving threat and provides non-lethal capabilities which enable freedom of movement across depth/breadth of the operational environment.
FY 2018 budget request funds Electronic Warfare Development.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	18.843	34.642	61.215	-	61.215
Current President's Budget	20.586	37.242	71.671	-	71.671
Total Adjustments	1.743	2.600	10.456	-	10.456
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	2.441	-			
• SBIR/STTR Transfer	-0.698	-			
• Adjustments to Budget Years	0.000	2.600	10.456	-	10.456

Change Summary Explanation

FY 2016 Funding reflects an Above Threshold Reprogramming (16-19 PA) increase in the amount of 2.441 million and (.698) million transfer in support of SBIR/STTR.

FY 2018 Funding reflects the following adjustments by project:

- Project DX5 increase of funding in the amount of 10.712 million supports Capability Drop 3 (CD3) development, which includes Cyber Situational Awareness, test and support activities and Program Management Office.
- Project DX6 decrease in the amount of (.235) million is a result of realignment of program requirements.
- Project ET7 increase of .145 million supports ongoing Interference Cancellation (IC) Light technology and IC algorithm technology development efforts.
- Project VS6 decrease in the amount of (.031) million is a result of realignment of program requirements.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>				Project (Number/Name) DX5 / <i>Electronic Warfare And Management Tool</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>DX5: Electronic Warfare And Management Tool</i>	-	10.739	19.440	33.120	-	33.120	20.475	18.908	11.214	18.278	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2018 Funding reflects increased funding in the amount of 10.712 million to support Capability Drop 3 (CD3) development, which includes Cyber Situational Awareness, test and support activities and Program Management Office.

A. Mission Description and Budget Item Justification

The Electronic Warfare Planning and Management Tool (EWPMT) will provide the Electronic Warfare Officer (EWO) and Spectrum Manager the ability to control and manage the Electromagnetic Spectrum (EMS). EWPMT will provide: capabilities to plan, coordinate, manage, and deconflict electronic warfare (EW) activities, the ability to employ assets to conduct offensive EW targeting, use of the Electromagnetic Spectrum and the ability to synchronize EW spectrum operations within the Cyber Electromagnetic Activities (CEMA) cell. EWPMT is a suite of software tools and applications that will provide a spectrum Common Operating Picture for the EWO and Spectrum Manager. EWPMT will integrate data elements from Mission Command, Intelligence, and Fires to achieve a Common Operating Picture of the Electromagnetic Operational Environment.

Justification:

FY2018 funds in the amount of \$33.120 million will complete Capability Drop 2 (CD2) development, test and support activities, as well as begin CD3 initial development for the EWPMT program.

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

	FY 2016	FY 2017	FY 2018
Title: EWPMT	10.739	19.440	33.120
Description: EWPMT is a suite of software tools and applications that will allow the Commander and staff a mission command capability to plan, coordinate, manage, and de-conflict unit EW and spectrum management activities.			
FY 2016 Accomplishments: Completed CD1 development, test and support activities Awarded CD2 development, test and support activities			
FY 2017 Plans: Funds provided for CD2 software development, test support activities, integration and program management office operations for the EWPMT program			
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 / 5	R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) DX5 / <i>Electronic Warfare And Management Tool</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Complete CD2 development, test and support activities			
Award CD3 development, test and support activities			
Accomplishments/Planned Programs Subtotals	10.739	19.440	33.120

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
• OPA: K00002 - <i>EW Planning & Management Tools (EWPMT)</i>	6.652	3.235	5.805	-	5.805	5.947	7.846	8.145	1.000	Continuing	Continuing

Remarks
EWPMT Fielding Support (New Equipment Training (NET), delta training, Interim Contractor Support (ICS) and Program Management (PM)).

D. Acquisition Strategy
EWPMT is an Automated Information System (AIS) that will follow an evolutionary acquisition strategy using an Incrementally Deployed Software Intensive Program for rapid development and continuous product improvements. The overall strategy is to deploy software Capability Drops (CDs) to allow an incremental merger of the Electronic Warfare and Spectrum Management software tools.

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 / 5				PE 0604270A / <i>Electronic Warfare Development</i>				DX5 / <i>Electronic Warfare And Management Tool</i>								
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	
PMO Staff/Travel	Various	PM Electronic Warfare & Cyber : Aberdeen Proving Ground, MD	6.758	1.110	Oct 2015	1.112	Dec 2016	2.159	Jan 2018	-		2.159	Continuing	Continuing	Continuing	
Subtotal			6.758	1.110		1.112		2.159		-		2.159	-	-	-	
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	
EMD Contract - EWPMT CD1	C/IDIQ	Raytheon : Fort Wayne, IN	16.234	1.966	Feb 2016	-		-		-		-	0.000	18.200	18.200	
EMD Contract - EWPMT CD2	C/IDIQ	Raytheon : Fort Wayne, IN	1.174	4.846	Jun 2016	14.170	Feb 2017	5.378	Dec 2017	-		5.378	0.000	25.568	23.470	
EMD Contract - EWPMT CD3	C/IDIQ	Raytheon : Fort Wayne, IN	0.000	-		-		18.749	Apr 2018	-		18.749	8.481	27.230	19.430	
Subtotal			17.408	6.812		14.170		24.127		-		24.127	8.481	70.998	61.100	
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	
EWPMT Technical and Engineering Support	Allot	Various : Various	14.248	2.535	Dec 2015	3.432	Dec 2016	3.152	Jan 2018	-		3.152	Continuing	Continuing	Continuing	
Subtotal			14.248	2.535		3.432		3.152		-		3.152	-	-	-	
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	
EWPMT Test support	MIPR	Various : Various	2.475	0.282	Dec 2015	0.726	Aug 2017	3.682	Jan 2018	-		3.682	Continuing	Continuing	Continuing	

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) DX5 / <i>Electronic Warfare And Management Tool</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												
EWPMT Contract																																								
Development and Test of CD 1																																								
Test CD 1 (Government Confidence test)																																								
(1) Limited Deployment Decision of CD1																																								
CD1 Fielding																																								
(2) Initial Operational Capability (IOC)																																								
Development and Test of CD2																																								
Test CD2 (Limited User Test)																																								
(3) Limited Deployment Decision of CD2																																								
Development and Test of CD3																																								
Development and Test of CD4																																								

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) DX5 / <i>Electronic Warfare And Management Tool</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
EWPMT Contract	1	2014	1	2020
Development and Test of CD 1	4	2014	3	2016
Test CD 1 (Government Confidence test)	2	2016	2	2016
Limited Deployment Decision of CD1	4	2016	4	2016
CD1 Fielding	4	2016	2	2017
Initial Operational Capability (IOC)	1	2017	1	2017
Development and Test of CD2	4	2016	2	2018
Test CD2 (Limited User Test)	2	2018	2	2018
Limited Deployment Decision of CD2	4	2018	4	2018
Development and Test of CD3	3	2018	1	2020
Development and Test of CD4	4	2019	4	2021

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>				Project (Number/Name) DX6 / <i>Multi-Function Electronic Warfare (MFEW)</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
DX6: <i>Multi-Function Electronic Warfare (MFEW)</i>	-	0.000	3.969	24.310	-	24.310	46.738	48.943	42.257	23.617	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2018 Funding reflects project DX6 decrease in the amount of (.235) million, a result of realignment of program requirements.

A. Mission Description and Budget Item Justification

The Multi-Function EW (MFEW) is a System of Systems that will provide the BCT Commander with an organic airborne and ground offensive Electronic Attack (EA) and Electronic Warfare Support (ES) capability. MFEW-Air and MFEW-Ground variants empower Commanders to shape the Electromagnetic Spectrum (EMS) to their advantage. MFEW will provide commanders with an organic EW capability that dramatically improves a land force's ability to seize, retain, and exploit an advantage within the EMS in order to execute successful unified land operations. These capabilities give the commander a competitive advantage by denying, degrading the enemy's ability to conduct Command and Control (C2), Intelligence, Surveillance and Reconnaissance (ISR), and targeting, and allows the commander to optimize effects within the EMS at the time and place of their choosing. These systems are networked with the Electronic Warfare Planning and Management Tool (EWPMT) to allow remote operation and dynamic tasking/reprogramming.

MFEW-Air is an airborne payload to be mounted on both manned and unmanned ariel platforms. MFEW-Air is comprised of three variants: Air Large (Class IV Unmanned Aerial Vehicle), Air Small (Class III Unmanned Aerial Vehicle), and manned rotary wing payloads. MFEW-Air will retain the capability to operate independently, but when integrated into a system of systems will provide a layered EW approach that also will include the MFEW-Ground variants. This will provide extended target frequency range coverage, increased target geo-location precision, increased target standoff range, and increased persistence on target in all weather conditions day or night.

Justification:

FY2018 Base dollars in the amount of \$24.310 million will complete MFEW-Air Large Milestone B (MS B) activities with a MS B Decision and competitive award of an Engineering and Manufacturing Developmental (EMD) contract; and commence MFEW-Ground pre-Milestone B activities.

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

	FY 2016	FY 2017	FY 2018
Title: Multi-Function EW (MFEW) Air	-	3.969	20.329
Description: MFEW-Air is an airborne Electronic Warfare payload to be integrated onto a Class IV Unmanned Aerial Vehicle to provide offensive Electronic Attack (EA) and Electronic Support (ES) capability to the BCT.			
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) DX6 / <i>Multi-Function Electronic Warfare (MFEW)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
MFEW: Develop MS B documentation in support of FY2018 Milestone B.				
FY 2018 Plans: MS B decision and award Engineering & Manufacturing Development (EMD) contract for the EMD Phase of MFEW-Air by 3QFY18.				
Title: Multi-Function EW (MFEW) Ground Description: MFEW-Ground pre-Milestone B activities.		-	-	3.981
FY 2018 Plans: Develop required statutory/regulatory documentation and Request for Proposal (RFP) to support a Milestone B decision and EMD contract award in FY19.				
Accomplishments/Planned Programs Subtotals		-	3.969	24.310
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy The Multi-Function EW (MFEW) is a System of Systems that will provide the BCT Commander with an organic offensive Electronic Attack (EA), and Electronic Warfare Support (ES), and Defensive Electronic Attack (DEA) capability. Initially, an air large variant payload will be developed. MFEW will deliver scalable non-lethal effects to support Unified Land Operations and protect personnel, equipment and facilities. A competitive contract award is planned for MFEW-Air.				
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 / 5	R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) DX6 / <i>Multi-Function Electronic Warfare (MFEW)</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 Office Support - MFEW Air	TBD	PM Electronic Warfare & Cyber : Aberdeen Proving Ground, MD	0.000	-		0.396	May 2017	0.235	Jan 2018	-		0.235	0.000	0.631	0.000
Program Management Office Support - MFEW Ground	TBD	PM Electronic Warfare & Cyber : Aberdeen Proving Ground, MD	0.000	-		-		0.206	Jan 2018	-		0.206	0.000	0.206	0.000
Subtotal			0.000	-		0.396		0.441		-		0.441	0.000	0.837	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			
MFEW Development Contract	C/TBD	PM Electronic Warfare & Cyber : Aberdeen Proving Ground, MD	0.000	-		-		17.528	Jun 2018	-		17.528	0.000	17.528	0.000
Subtotal			0.000	-		-		17.528		-		17.528	0.000	17.528	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			
Contractor Engineering - MFEW Air	TBD	TBD : Aberdeen Proving Ground, MD	0.000	-		0.750	May 2017	1.125	Jan 2018	-		1.125	0.000	1.875	0.000
Government Engineering - MFEW Air	MIPR	TBD : Aberdeen Proving Ground, MD	0.000	-		1.500	May 2017	1.040	Jan 2018	-		1.040	0.000	2.540	0.000
Technical Support - MFEW Air	TBD	TBD : Aberdeen Proving Ground, MD	0.000	-		1.323	May 2017	0.331	Jan 2018	-		0.331	0.000	1.654	0.000
Contractor Engineering - MFEW Ground	TBD	TBD : Aberdeen Proving Ground, MD	0.000	-		-		2.088	Jan 2018	-		2.088	0.000	2.088	0.000

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army													Date: May 2017		
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>					Project (Number/Name) DX6 / <i>Multi-Function Electronic Warfare (MFEW)</i>						
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
Government Engineering - MFEW Ground	MIPR	TBD : Aberdeen Proving Ground, MD	0.000	-		-		1.507	Jan 2018	-		1.507	0.000	1.507	0.000
Technical Support - MFEW Ground	TBD	TBD : Aberdeen Proving Ground, MD	0.000	-		-		0.250	Jan 2018	-		0.250	0.000	0.250	0.000
Subtotal			0.000	-		3.573		6.341		-		6.341	0.000	9.914	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	-		3.969		24.310		-		24.310	0.000	28.279	0.000
Remarks															

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) DX6 / <i>Multi-Function Electronic Warfare (MFEW)</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
MS B Documentation Preparation (Air)																												
(1) Request For Proposal (RFP) Decision Point (Air)																	▲ 1											
(2) Milestone B (Air)													▲ 2															
MFEW Development (Air)																												
Developmental Test (DT)/Flight Testing (Air)																												
(3) Milestone C (Air)																					▲ 3							
Operational Assessment (OA) (Air)																	■											
IOTE (Air)																									■			
MFEW Development (Ground)																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) DX6 / <i>Multi-Function Electronic Warfare (MFEW)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MS B Documentation Preparation (Air)	3	2017	3	2018
Request For Proposal (RFP) Decision Point (Air)	1	2018	1	2018
Milestone B (Air)	3	2018	3	2018
MFEW Development (Air)	3	2018	4	2020
Developmental Test (DT)/Flight Testing (Air)	4	2019	1	2022
Milestone C (Air)	3	2021	3	2021
Operational Assessment (OA) (Air)	3	2020	3	2020
IOTE (Air)	4	2021	4	2021
MFEW Development (Ground)	3	2018	4	2022

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>				Project (Number/Name) ET7 / <i>Radio Frequency Interference Mitigation</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>ET7: Radio Frequency Interference Mitigation</i>	-	0.000	4.151	4.454	-	4.454	4.356	2.674	2.079	3.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2018 Funding reflects project ET7 increase of .145 million in support of Interference Cancellation (IC) Light technology and IC algorithm technology development efforts.

A. Mission Description and Budget Item Justification

Radio Frequency Interference Mitigation (RIM) is a cross cutting capability to centrally manage and provide oversight to identify, define, test, and coordinate development of Radio Frequency (RF) interference mitigation material solutions to resolve mutual RF interference and electromagnetic fratricide for Spectrum Dependent Systems (SDS).

Centralized management of RIM offers a holistic approach for identification, system of systems engineering, developmental testing, and maturing of RIM solutions to address current and evolving RF interference issues. User and acquisition communities will synchronize, integrate, and codify RIM requirements to facilitate the cross cutting approach necessary for the efficient procurement of common RIM products. This approach will eliminate the need for separate hardware and platform integration research and development efforts for SDS and platforms. An integrated approach will eliminate the need for separate hardware and platform integration research and development efforts for SDS and platform Program Managers. RIM products are intended to preserve the investment that the Army has made in current Electronic Warfare (EW) and Mission Command Transport SDS and provide a strategy for future efforts for new SDS development with integrated RIM solutions.

Justification:

FY 2018 Base funds in the amount of \$4.454 million will provide engineering support activities to continue the development of Interference Cancellation (IC) Light technology and develop the IC Algorithm technology to mitigate interference between Force Protection and Communication systems.

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

	FY 2016	FY 2017	FY 2018
Title: RF Interference Mitigation	-	4.151	4.454
Description: RIM is a System of Systems Enterprise approach that will allow Spectrum Dependent Systems to co-exist with Force Protection assets.			
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) ET7 / <i>Radio Frequency Interference Mitigation</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
Funds provide engineering support activities to develop tunable filters to mitigate interference between Force Protection and Communication systems.				
FY 2018 Plans: Continue IC development, award IC algorithm development, and provide engineering support.				
Accomplishments/Planned Programs Subtotals		-	4.151	4.454
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy Radio Frequency (RF) Interference Mitigation (RIM) will follow a System of Systems, enterprise strategy to develop and test hardware solutions such as tunable filters, Interference Cancellers (IC) to address RF interference on Army platforms. Designated platforms will procure, integrate and test RIM solutions with their association spectrum dependent systems. The RIM acquisition strategy shifted focus from tunable filter technology to IC technology. The decision to shift focus from tunable filters to IC technology was a direct result of the S&T community accelerating the technical maturity. IC technology will enhance the warfighters ability to utilize the spectrum compared to tunable filter technology. Planned Developmental Testing (DT) in FY18 for the tunable filters is no longer required based on the change in the acquisition strategy.				
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 / 5					R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>				Project (Number/Name) VS6 / <i>Integrated Electronic Warfare 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
VS6: <i>Integrated Electronic Warfare Systems</i>	-	9.847	9.682	9.787	-	9.787	9.942	10.098	10.257	5.571	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2018 Funding reflect project VS6 decrease in the amount of (.031) million, a result of realignment of program requirements.

A. Mission Description and Budget Item Justification

Counter Radio Controlled Improvised Explosive Device (RCIED) Electronic Warfare (CREW) provides for protection for ground forces operating in vehicle convoys, single vehicle operations and fixed locations in all theatres of operations. It is programmable to migrate with the evolving threat and provides non-lethal capabilities which enable freedom of movement across depth/breadth of the operational environment.

Justification: FY2018 Base dollars in the amount of \$9.787 million continues to support the development of CREW Relevancy technologies.

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

	FY 2016	FY 2017	FY 2018
Title: IEWS	9.847	9.682	9.787
Description: The IEW System (IEWS) Systems of Systems (SoS) will consist of Electronic Warfare Planning and Management Tool (EWPMT), Multi-Function EW (MFEW), and Defensive Electronic Attack (DEA).			
FY 2016 Accomplishments: CREW Relevancy: Awarded a five year indefinite delivery indefinite quantity (IDIQ) contract for development of advanced techniques, enhanced force protection, SAASM compliance, improved interoperability with comms systems, and testing.			
FY 2017 Plans: CREW Relevancy: Continue the development and testing of HW/SW solutions for CREW-2 Duke.			
FY 2018 Plans: CREW Relevancy: Continue the development and testing of HW/SW solutions for CREW-2 Duke, specifically, development for the Secondary Unit system upgrade.			
Accomplishments/Planned Programs Subtotals	9.847	9.682	9.787

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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 / 5	R-1 Program Element (Number/Name) PE 0604270A / <i>Electronic Warfare Development</i>	Project (Number/Name) VS6 / <i>Integrated Electronic Warfare Systems</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>
• CREW: VA8000 CREW	2.960	-	-	-	-	-	-	-	-	0	2.960

Remarks

D. Acquisition Strategy

CREW Relevancy will provide for the continued growth and conduct of research, development and testing against emerging Radio Controlled Improvised Explosive Device (RCIED) threats. Continuing research, development and testing will allow the technology to remain relevant and responsive to all approved user requirements.

Award five year indefinite delivery indefinite quantity (ID/IQ) contract enables maximum flexibility as technology matures and as the RCIED threat changes. Cost Plus Fixed Fee (CPFF) ID/IQ Task Orders will be awarded throughout the five year effort to address the developing threat with system improvements.

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 5: System Development & Demonstration (SDD)					PE 0604280A / Joint Tactical Radio							
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	-	4.415	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.415
DZ5: Handheld, Manpack and Small Form Fit (JTRS HMS)	-	4.415	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.415

Note

In coordination with G8 and the Army Budget Office, HMS PE 0604280A was realigned under PE 0605042A in PB17. The HMS program will execute funding under two separate project codes for Manpack Radio (Project Code FA1) and Rifleman Radio (Project Code FA2) beginning in FY 2017.

A. Mission Description and Budget Item Justification

The Handheld, Manpack, and Small Form Fit (HMS) radio program is a materiel solution meeting requirements for Software Communications Architecture (SCA) compliant hardware system hosting SCA-compliant Government Purpose Rights software waveforms (applications). HMS is an Acquisition Category IC program that encompasses specific requirements to support the U.S. Army, Air Force, Navy, Marine Corps and Special Operations Command communications needs.

HMS provides voice and data communications to the tactical edge/most disadvantaged warfighter with an on-the-move, at-the-halt, and stationary Line of Sight (LOS) / Beyond Line of Sight (BLOS) capability for both dismounted personnel and platforms. HMS radio systems are software reprogrammable, networkable, multi-mode systems capable of simultaneous voice and data communications.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	4.546	0.000	0.000	-	0.000
Current President's Budget	4.415	0.000	0.000	-	0.000
Total Adjustments	-0.131	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.131	-			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604280A / Joint Tactical Radio				Project (Number/Name) DZ5 / Handheld, Manpack and Small Form Fit (JTRS HMS)			
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
DZ5: Handheld, Manpack and Small Form Fit (JTRS HMS)	-	4.415	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.415
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In coordination with G8 and the Army Budget Office, HMS PE 0604280A was realigned under PE 0605042A in PB17. The HMS program will execute funding under separate project codes for Manpack Radio (Project Code FA1) and Rifleman Radio (Project Code FA2) beginning in FY 2017.

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HMS provides voice and data communications to the tactical edge/most disadvantaged warfighter with an on-the-move, at-the-halt, and stationary Line of Sight (LOS) / Beyond Line of Sight (BLOS) capability for both dismounted personnel and platforms. HMS radio systems are software reprogrammable, networkable, multi-mode systems capable of simultaneous voice and data communications.

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

	FY 2016	FY 2017	FY 2018
Title: Test, Evaluation, Engineering, and PMO Support	4.415	-	-
Description: The Test and Evaluation focuses on the evaluation of key technical and operational characteristics of the system: Radio Frequency performance, security, Reliability, Availability & Maintainability, and survivability requirements, in addition to operational environmental performance requirements as per the Capability Production Document. All radios awarded a contract will be required to go through the Qualification Test (QT) to qualify for a Customer Test (CT) and gain eligibility to participate at the Initial Operational Test & Evaluation (IOT&E) to ensure the radio is operational at full capability and ready to be used by soldiers. The QT and CT will be executed by Electronic Proving Ground and will serve as risk reduction events prior to the IOT&E as opposed to developmental test to support incremental system improvement.			
The QT phase will facilitate selection of the radios able to participate in the CT. The QT will validate the manufacturer's ability to meet the minimum functional requirements identified in the Performance Requirements Document. Radios that successfully demonstrate key capabilities during QT will proceed to the CT; however, there will be an opportunity to re-enter competition during an On-Ramp phase in the future. The CT will serve as a risk reduction event for the IOT&E as data from this event will be considered for manufacturer down-select and an initial buy decision.			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604280A / <i>Joint Tactical Radio</i>	Project (Number/Name) DZ5 / <i>Handheld, Manpack and Small Form Fit (JTRS HMS)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
The IOT&E will include support from Army and DoD operational testers and will use communication scenarios based on the Operational Mode Summary / Mission Profile of the system(s) under test. The operational tests will be designed to validate that the HMS products meets the users' needs in terms of effectiveness, suitability and survivability in an operationally realistic environment. Results from the IOT&E will facilitate the delivery orders for Full Rate Production.			
<i>FY 2016 Accomplishments:</i> The FY 2016 budget provided funding to continue executing the approved testing strategy. Specifically, the funding was used to partially fund the MP Qualification and Customer Tests. The remaining funding was used for PMO and Engineering Support.			
Accomplishments/Planned Programs Subtotals	4.415	-	-

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>
• RDTE: 0605042A, FA1: <i>Manpack Radio</i>	-	14.819	10.039	-	10.039	3.826	5.088	11.003	11.164	Continuing	Continuing
• RDTE: 0605042A, FA2: <i>Rifleman Radio</i>	-	4.005	10.037	-	10.037	3.825	5.090	11.003	11.164	Continuing	Continuing
• OPA: B90000, B90210: <i>JTRS Cluster 5 (Handheld)</i>	29.509	-	-	-	-	-	-	-	-	0.000	29.509
• OPA: B90000, B90215: <i>JTRS (Manpack)</i>	25.131	-	-	-	-	-	-	-	-	0.000	25.131
• OPA: B95004, B95006: <i>Handheld Radio</i>	-	43.734	37.773	-	37.773	53.511	60.951	85.020	73.255	Continuing	Continuing
• OPA: B95004, B95007: <i>Manpack Radio</i>	-	229.911	317.578	-	317.578	305.005	338.962	317.760	401.571	Continuing	Continuing

Remarks
HMS RDTE funding for FY 2016 and prior is held under PE 0604280A Joint Tactical Radios. HMS Procurement funding for FY 2016 and prior is held under Standard Study Number (SSN) B90210 JTRS Cluster 5 (Handheld) and SSN B90215 JTRS (Manpack). Due to a request to provide more transparency into the program, HMS RDTE funding beginning in FY 2017 will move to PE: 0605042A Tactical Network Radio Systems (Low-Tier): FA1 Manpack Radio and FA2 Rifleman Radio. HMS Procurement funding beginning in FY 2017 will move to SSN B95004 Handheld Manpack Small Form Fit: SSN B95006 Handheld and SSN B95007 Manpack.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604280A / <i>Joint Tactical Radio</i>	Project (Number/Name) DZ5 / <i>Handheld, Manpack and Small Form Fit (JTRS HMS)</i>

D. Acquisition Strategy

HMS is currently executing a May 2014 approved acquisition strategy to procure Non-Developmental Items (NDI) through full and open competition open to all potential industry partners.

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 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604290A / Mid-tier Networking Vehicular Radio (MNVR)
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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	-	8.416	12.172	10.589	-	10.589	5.401	20.287	4.947	0.225	Continuing	Continuing
DW1: Mid-Tier Wideband Networking Vehicular Radio Mnv	-	8.416	12.172	10.589	-	10.589	5.401	20.287	4.947	0.225	Continuing	Continuing

Note

The Army has postponed Initial Operational Test & Evaluation (IOT&E) from FY 2017 to FY 2020, to take advantage of next generation radio improvements.

A. Mission Description and Budget Item Justification

The Mid-tier Networking Vehicular Radios (MNVR) enables the extension of data services within the tactical network through seamless integration of the upper and lower tiers; providing software-defined, multi-channel networking radios for a wide variety of Army tactical vehicles to meet the Army's requirement for the Mid-tier Wideband Networking (MWN) capability. The MNVR provides self-forming and self-healing communication networks from the brigade to the platoon level throughout the full range of military operations.

The MNVR, a modified Non-Developmental Item (NDI), supports Army Mission Command operational requirements with a multi-channel, Type 1 (supporting multiple independent levels of security), vehicular mounted radio hosting networking waveforms Wideband Networking Waveform (WNW) and Soldier Radio Waveform (SRW). The MNVR narrows the data capability gap at the Brigade Combat Team (BCT) company level and provides the capability to build a data extension to the lowest echelons, and then enables the extension of services from the Forward Operating Base (FOB) to the platform. MNVR provides a dynamic, scalable, On-the-Move (OTM) network architecture, connecting the Soldier to the Mission Command (MC) Network and enhances capability to exchange voice and data simultaneously and faster than current systems. The advanced network waveforms provide rapid distribution of data and imagery with increased information assurance protection and automatic routing across complex terrain. The system operates Internet Protocol (IP) based networking waveforms offering increased data throughput through self-forming, self-healing, managed communication networks. Its route and retransmit functionality links waveforms in different frequency bands, within the 2 Megahertz (MHz) to 2 Gigahertz (GHz) range, to form one cohesive network. MNVR nomenclature has been designated as AN/VRC-118(V)1.

A single award contract was awarded on 24 September 2013, Indefinite Delivery Indefinite Quantity (IDIQ), firm fixed price, 3-year ordering period. Production of 232 radios for Test & Evaluation and certification purposes was completed in 3QFY 2014. On 3 Oct 2016, Defense Acquisition Executive (ADM) published a MNVR MS C Acquisition Decision Memorandum. Product Manager (PdM) MNVR will prepare for Government Regression Testing (GRT) and evaluation planning for First Unit Equipped (FUE).

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604290A / <i>Mid-tier Networking Vehicular Radio (MNVR)</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	8.763	12.172	10.700	-	10.700
Current President's Budget	8.416	12.172	10.589	-	10.589
Total Adjustments	-0.347	0.000	-0.111	-	-0.111
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.347	-			
• Adjustments to Budget Years	0.000	0.000	-0.111	-	-0.111

Change Summary Explanation

Reduction in funding reflects delaying IOTE to FY20.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604290A / <i>Mid-tier Networking Vehicular Radio (MNVR)</i>				Project (Number/Name) DW1 / <i>Mid-Tier Wideband Networking Vehicular Radio Mnv</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
DW1: <i>Mid-Tier Wideband Networking Vehicular Radio Mnv</i>	-	8.416	12.172	10.589	-	10.589	5.401	20.287	4.947	0.225	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
The Army has postponed Initial Operational Test & Evaluation (IOT&E) from FY 2017 to FY 2020.

A. Mission Description and Budget Item Justification

The Mid-tier Networking Vehicular Radios (MNVR) enables the extension of data services within the tactical network through seamless integration of the upper and lower tiers; providing software-defined, multi-channel networking radios for a wide variety of Army tactical vehicles to meet the Army's requirement for the Mid-tier Wideband Networking (MWN) capability. The MNVR provides self-forming and self-healing communication networks from the brigade to the platoon level throughout the full range of military operations.

The MNVR, a modified Non-Developmental Item (NDI), supports Army Mission Command operational requirements with a multi-channel, Type 1 (supporting multiple independent levels of security), vehicular mounted radio hosting networking waveforms, Wideband Networking Waveform (WNW) and Soldier Radio Waveform (SRW). The MNVR narrows the data capability gap at the Brigade Combat Team (BCT) company level and provides the capability to build a data extension to the lowest echelons, and then enables the extension of services from the Forward Operating Base (FOB) to the platform. MNVR provides a dynamic, scalable, On-the-Move (OTM) network architecture, connecting the Soldier to the Mission Command (MC) Network and enhances capability to exchange voice and data simultaneously and faster than current systems. The advanced network waveforms provide rapid distribution of data and imagery with increased information assurance protection and automatic routing across complex terrain. The system operates Internet Protocol (IP) based networking waveforms offering increased data throughput through self-forming, self-healing, managed communication networks. Its route and retransmit functionality links waveforms in different frequency bands, within the 2 Megahertz (MHz) to 2 Gigahertz (GHz) range, to form one cohesive network. MNVR nomenclature has been designated as AN/VRC-118(V)1.

A single award contract was awarded on 24 September 2013, Indefinite Delivery Indefinite Quantity (IDIQ), firm fixed price, 3-year ordering period. Production of 232 radios for Test & Evaluation and certification purposes was completed in 3QFY 2014. On 3 Oct 2016, Defense Acquisition Executive (ADM) published a MNVR MS C Acquisition Decision Memorandum. Product Manager (PdM) MNVR will prepare for Government Regression Testing (GRT) and evaluation planning for First Unit Equipped (FUE).

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Title: Mid-tier Networking Vehicular Radio (MNVR)	8.416	12.172	10.589

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604290A / <i>Mid-tier Networking Vehicular Radio (MNVR)</i>	Project (Number/Name) DW1 / <i>Mid-Tier Wideband Networking Vehicular Radio Mnv</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Description: RDTE funding supports efforts to test and certify industry solutions for a modified NDI radio; contract management, and test & certification efforts through IOT&E.</p> <p>FY 2016 Accomplishments: FY 2016 supports efforts needed to execute the modified NDI strategy for a mid-tier networking vehicular radio capability; focus is on continued test and system certification efforts for the AN/VRC-118(V)1 MNVR. Planned activities include participation in a VCSA directed Mid-Tier Assessment at NIE 16.2, ongoing GRT, System of System (SoS) Risk Reduction Testing, range testing in a dense foliage environment, and preparation for IOT&E.</p> <p>FY 2017 Plans: FY 2017 supports system test and evaluation efforts needed to execute the modified NDI strategy for a mid-tier networking vehicular radio capability; focus is on continued test and system certification efforts for the AN/VRC-118(V)1 MNVR. Planned activities include conduct of IOT&E, from which an OMAR will be developed to inform a Full-Rate Production (FRP) decision in 3QFY 2018; development of a Request for Proposal (RFP) for follow-on radio contract award; Initial Operating Capability (IOC); and continued MNVR Systems Test and Evaluation efforts.</p> <p>FY 2018 Plans: FY2018 supports system test and evaluation efforts to execute the modified NDI strategy for the mid-tier networking vehicular radio capability; focus is on development of a Request for Proposal (RFP) release for follow on contract award; conduct Source Selection Performance Demonstration test, and engineering Contract Support.</p>			
Accomplishments/Planned Programs Subtotals	8.416	12.172	10.589

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
• OPA Funding - B51001: <i>Mid-tier Networking Vehicular Radio (MNVR)</i>	27.762	25.017	25.100	-	25.100	47.292	33.553	47.108	80.253	Continuing	Continuing

Remarks

D. Acquisition Strategy
The MNVR is a modified NDI industry solution for a multi-channel vehicular radio hosting networking waveforms. This modified NDI approach takes advantage of competitively priced, mature and producible technology that meets technical specifications.

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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 / 5	PE 0604290A / <i>Mid-tier Networking Vehicular Radio (MNVR)</i>	DW1 / <i>Mid-Tier Wideband Networking Vehicular Radio Mnvr</i>

An Acquisition Decision Memorandum (ADM) was signed on 20 September 2013 by the Defense Acquisition Executive (DAE), approving a Materiel Development Decision (MDD). The ADM designated MNVR as an ACAT 1D Special Interest Program under the continued oversight of the DAE. The ADM also approved the award of a competitive contract, and authorized the procurement of up to 232 modified NDI radios for Test & Evaluation, Platform Integration and Certification purposes in order to inform a MS C decision. On 3 Oct 2016, Defense Acquisition Executive (ADM) published a MNVR MS C Acquisition Decision Memorandum.

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 / 5	R-1 Program Element (Number/Name) PE 0604290A / Mid-tier Networking Vehicular Radio (MNVR)	Project (Number/Name) DW1 / Mid-Tier Wideband Networking Vehicular Radio Mnvr
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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			
Management Services - PMO	Various	Aberdeen Proving Ground : Maryland	36.424	0.105		0.316		0.385	Jun 2018	-		0.385	Continuing	Continuing	0.000
Management Services - Engineering Contractor Support	Various	Various : Various	0.000	-		5.065		2.675	Jan 2018	-		2.675	0.000	7.740	0.000
Subtotal			36.424	0.105		5.381		3.060		-		3.060	-	-	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			
Systems Test and Evaluation	Various	Multiple : Various	30.739	8.311		5.127		-		-		-	Continuing	Continuing	0.000
Dynamic Network Connectivity	TBD	To Be Determined : To Be Determined	0.000	-		1.664		1.873	Jun 2018	-		1.873	0.000	3.537	0.000
Source Selection Performance Demonstration (SSPDS) Tests	Various	Multiple : Various	14.301	-		-		5.656	Jan 2018	-		5.656	0.000	19.957	0.000
Subtotal			45.040	8.311		6.791		7.529		-		7.529	-	-	0.000

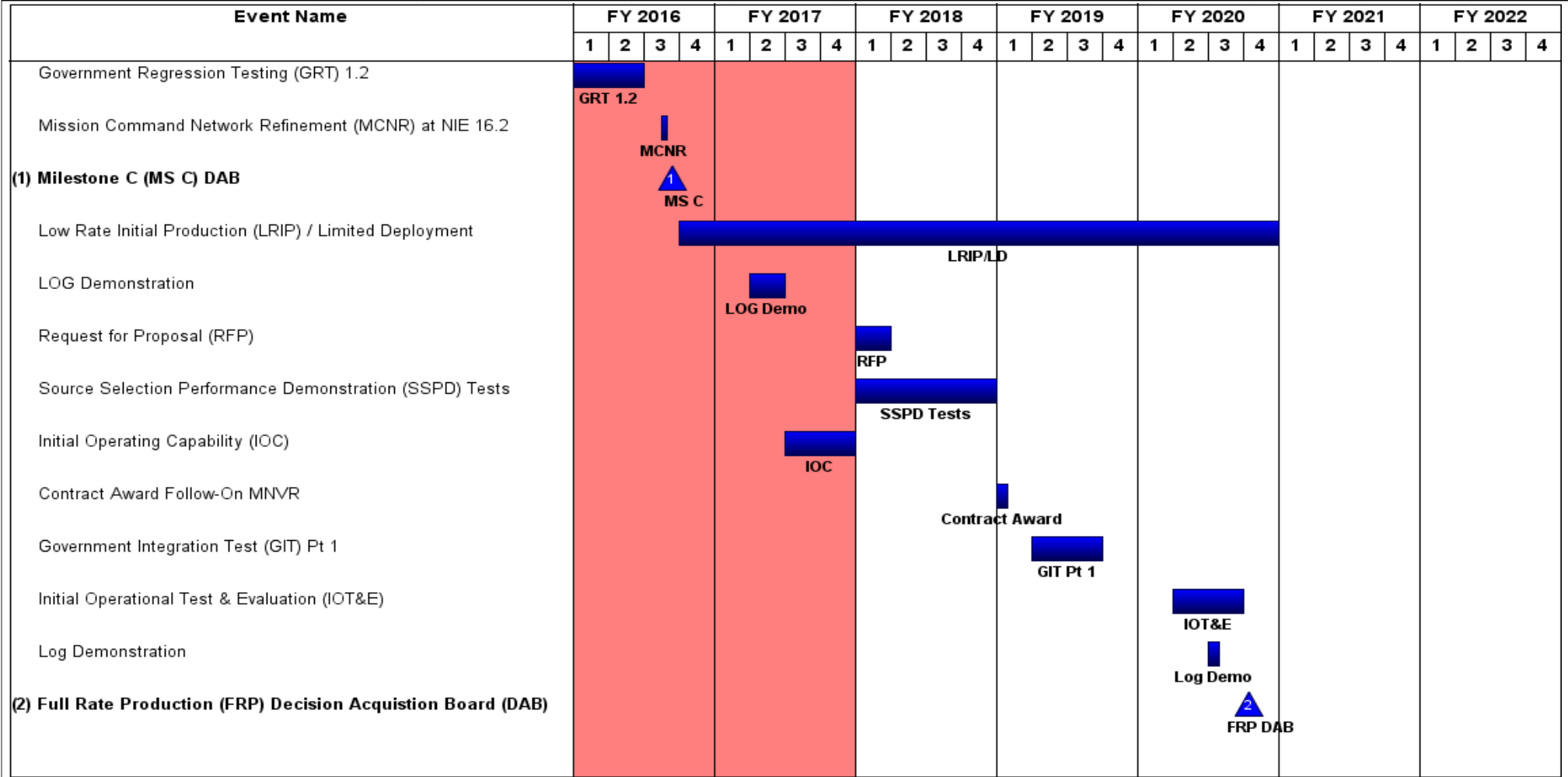
Project Cost Totals	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
	81.464	8.416	12.172	10.589	-	10.589	-	-	0.000

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604290A / <i>Mid-tier Networking Vehicular Radio (MNVR)</i>	Project (Number/Name) DW1 / <i>Mid-Tier Wideband Networking Vehicular Radio Mnvr</i>
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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604290A / <i>Mid-tier Networking Vehicular Radio (MNVR)</i>	Project (Number/Name) DW1 / <i>Mid-Tier Wideband Networking Vehicular Radio Mnvr</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
Full Rate Production (FRP)																					FRP							
Government Integration Test (GIT) Pt 2																					GIT Pt 2							

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604290A / <i>Mid-tier Networking Vehicular Radio (MNVR)</i>	Project (Number/Name) DW1 / <i>Mid-Tier Wideband Networking Vehicular Radio Mnvr</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Government Regression Testing (GRT) 1.2	1	2016	2	2016
Mission Command Network Refinement (MCNR) at NIE 16.2	3	2016	3	2016
Milestone C (MS C) DAB	3	2016	3	2016
Low Rate Initial Production (LRIP) / Limited Deployment	4	2016	4	2020
LOG Demonstration	2	2017	2	2017
Request for Proposal (RFP)	1	2018	1	2018
Source Selection Performance Demonstration (SSPD) Tests	1	2018	4	2018
Initial Operating Capability (IOC)	3	2017	4	2017
Contract Award Follow-On MNVR	1	2019	1	2019
Government Integration Test (GIT) Pt 1	2	2019	3	2019
Initial Operational Test & Evaluation (IOT&E)	2	2020	3	2020
Log Demonstration	3	2020	3	2020
Full Rate Production (FRP) Decision Acquisition Board (DAB)	4	2020	4	2020
Full Rate Production (FRP)	1	2021	4	2022
Government Integration Test (GIT) Pt 2	2	2021	3	2021

Note

06 May 2013: Joint Requirements Review Council (JROC) approved the MNVR Capability Production Document (CPD)
 09 May 2013: Defense Acquisition Executive (DAE) changed basis of the program from Directed Requirement to the MNVR CPD
 - Directed that MNVR would not field until all MS C requirements met. Delayed fielding from Capability Set (CS) 15 to CS 17
 20 Sept 2013: DAE signs MNVR Milestone Decision Document (MDD)
 24 Sept 2013: Army Contracting Command (ACC) awards MNVR contract to Harris Corporation; executed delivery order of 232 radios.
 May 2015: MNVR conducted a successful LUT at Network Integration Evaluation (NIE) 15.2 in preparation for MS C.
 May 2016: MNVR participated in the MCNR assessment at NIE 16.2 where the Army validated the mid-tier requirement, recommending to proceed to MS C, and the ARMY postponed IOT&E from FY 2017 to FY 2020.

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604290A / <i>Mid-tier Networking Vehicular Radio (MNVR)</i>	Project (Number/Name) DW1 / <i>Mid-Tier Wideband Networking Vehicular Radio Mnvr</i>
Oct 2016: MS C Achieved. On 3 Oct 2016, Defense Acquisition Executive (ADM) published a MNVR MS C Acquisition Decision Memorandum.		

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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 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604321A / All Source Analysis System
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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	-	4.309	3.958	4.774	-	4.774	7.839	4.241	3.872	3.988	Continuing	Continuing
B41: CI/HUMINT Software Products (MIP)	-	3.242	2.782	3.274	-	3.274	2.304	2.179	1.771	1.824	Continuing	Continuing
B51: Machine - Foreign Language Translation System	-	1.067	1.176	1.500	-	1.500	5.535	2.062	2.101	2.164	Continuing	Continuing

A. Mission Description and Budget Item Justification

The All Source Analysis System (ASAS) provided US Army commanders at all echelons from battalion to Army Service Component Command (ASCC) with automated support to the management and planning, processing and analysis, and dissemination of intelligence, counterintelligence, and electronic warfare. ASAS provided the means to enhance the commander's timely and comprehensive understanding of enemy deployments, capabilities, and potential courses of action. The system used standard joint and Army protocols and message formats to interface with selected National, joint, theater, and tactical intelligence, surveillance, and reconnaissance systems and preprocessors and Army, joint, and coalition battle command systems. The ASAS Family of Systems migrated into the Distributed Common Ground System-Army (DCGS-A) program and the Army is using it as the initial platform to provide accelerated DCGS-A capabilities to the force.

The Counterintelligence (CI) and Human Intelligence (HUMINT) Automated Reporting and Collection System (CHARCS) is the Army's CI and HUMINT tactical collection and reporting system. CHARCS provides automation support for information collection, reporting, investigations, source & interrogation operations and document exploitation. The CHARCS automation architecture extends from the individual HUMINT team soldier or CI agent to the Corps Analysis and Control Element (ACE). CHARCS reports digital data such as maps, overlays, images, video, biometrics, scanned documents and audio files. These media are transmitted through secure networks and interfaces with the DCGS-A for detailed analysis and creation of finished intelligence products. Collection and reporting teams at Military Intelligence (MI) battalions and their operational managers are equipped with one of two CHARCS systems. The first is the AN/PYQ-8 Individual Tactical Reporting Tool (ITRT) which provides collection and processing devices for individual HUMINT team member or CI agents. The second is the AN/PYQ-3 CI/HUMINT Automated Tool Set (CHATS) which provides the team leader tools to process and manage team-collected information and a robust set of devices such as printers, scanners, cameras and audio recorders to assist the collection mission. Each CHATS has an associated Mission Support Peripheral Sets and Kits (MS-PSK) or Collection Peripheral Sets and Kits (C-PSK).

The Machine Foreign Language Translation System (MFLTS) develops, fields, and sustains a basic automated foreign speech and text translation capability for Army tactical systems to augment and compliment limited human linguistic resources. These integrated automated translation capabilities will be applicable across three different system configurations; a hand-held/wearable portable device, a laptop/mobile device, and in a networked/web-enabled system. The software modules will translate English from a prioritized list of languages in a prioritized collection of domains (e.g. medical, intelligence, base security). MFLTS is interoperable with Commercial Off-The-Shelf (COTS) and Government Off-The-Shelf (GOTS) automation equipment to include the Distributed Common Ground System-Army (DCGS-A) and Nett Warrior, and will be interoperable with a future version of the CI/HUMINT Automated Reporting and Collection System (CHARCS).

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604321A / <i>All Source Analysis System</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	4.309	3.958	4.923	-	4.923
Current President's Budget	4.309	3.958	4.774	-	4.774
Total Adjustments	0.000	0.000	-0.149	-	-0.149
• 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	-0.149	-	-0.149

Change Summary Explanation

FY18 base budget year adjustments reflect a \$.159 million increase to CHARCS and a \$.308 million decrease to MFLTS. Net result is \$.149 million decrease to the Program Element.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604321A / All Source Analysis System	Project (Number/Name) B41 / CI/HUMINT Software Products (MIP)
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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
B41: CI/HUMINT Software Products (MIP)	-	3.242	2.782	3.274	-	3.274	2.304	2.179	1.771	1.824	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Counterintelligence (CI) and Human Intelligence (HUMINT) Automated Reporting and Collection System (CHARCS) is the Army's CI and HUMINT tactical collection and reporting system. CHARCS provides automation support for information collection, reporting, investigations, source & interrogation operations and document exploitation. The CHARCS automation architecture extends from the individual HUMINT team soldier or CI agent to the Corps. CHARCS reports digital data such as maps, overlays, images, video, biometrics, scanned documents and audio files. These media are transmitted through secure networks and interfaces with the Distributed Common Ground System-Army (DCGS-A) for detailed analysis and creation of finished intelligence products. Collection and reporting teams at Military Intelligence (MI) battalions and their operational managers are equipped with one of two CHARCS systems. The first is the AN/PYQ-8 Individual Tactical Reporting Tool (ITRT) which provides collection and processing devices for individual HUMINT team member or CI agents. The second is the AN/PYQ-3 CI/HUMINT Automated Tool Set (CHATS) which provides the team leader and Operational Management Team (OMT) tools to process and manage team-collected information and a robust set of devices such as printers, scanners, and cameras to assist the collection mission. Each CHATS has an associated Mission Support Peripheral Sets and Kits (MS-PSK) or Collection Peripheral Sets and Kits (C-PSK). Phasing in of the Mobile Hand Held (M H/H), to displace the C-PSK, will begin in FY 2018.

The C-PSK provides specialized collection component capabilities to support CI/HUMINT collection missions. C-PSK capabilities are commercial-off-the-shelf (COTS) technologies and include video and camera equipment, global positioning system (GPS), voice recording device and infrared strobe lights. Phasing in of the Mobile Hand Held, to displace the C-PSK, will begin in FY 2018. The MS-PSK provides specialized collection component capabilities to support CI/HUMINT collection missions at the OMT. MS-PSK capabilities are COTS technologies and include night vision photography & video, captured materiel tracking, Credibility Assessment Capability, Digital Media Forensics software, and Document Exploitation software.

FY 2018 Base amount of \$3.274 million will fund efforts for the development of a single CI/HUMINT software baseline in coordination with DCGS-A, software testing, software support to the Mobile Handheld (M H/H), and system engineering management support.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Development and Integration toward a single CI/HUMINT Software baseline; software testing of v1.0.4.2; software baseline enhancement and testing of v1.0.4.2.2 and v1.0.4.4; increased SW perf. cap.	3.242	2.782	3.274	-	3.274
Description: Development and Integration toward a single CI/HUMINT Software baseline; software testing of v1.0.4.2; software baseline enhancement and testing of v1.0.4.2.2 and v1.0.4.4; increased software (SW) performance capability; Hardware (HW) integration testing of CHARCS SW. Integration of Exploitation software onto MHH.					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604321A / All Source Analysis System	Project (Number/Name) B41 / CI/HUMINT Software Products (MIP)

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> Initiated efforts to create a single CI/HUMINT software baseline in coordination with DCGS-A. Continued effort for testing related to AIC and COE compliance for v1.0.4.2.2. Software baseline enhancement and testing for v1.0.4.4. Provided system engineering management support.</p> <p><i>FY 2017 Plans:</i> Continue efforts for a single CI/HUMINT software baseline in coordination with DCGS-A. Continue software baseline enhancement and testing for v1.0.4.2.2 and v1.0.4.4. Provide system engineering management support.</p> <p><i>FY 2018 Base Plans:</i> Will continue efforts for development of a single CI/HUMINT software baseline in coordination with DCGS-A. Will continue software baseline enhancement and testing for v1.0.4.4. Will initiate integration of exploitation software onto Mobile Hand Held platform. Will provide system engineering management support.</p>					
Accomplishments/Planned Programs Subtotals	3.242	2.782	3.274	-	3.274

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
• CI HUMINT AUTO REPRTING AND COLL (C: BK5275	11.402	14.891	7.815	14.460	22.275	8.092	8.250	8.424	6.084	Continuing	Continuing

Remarks

D. Acquisition Strategy

Program capability documentation was updated to include Capabilities Development Document (CDD) Increment 2 requirements in CHARCS Capabilities Production Document (CPD) Increment 1, Revision 1, which was signed 6 September 2012. CHARCS is a post-Milestone C program. CHARCS is leveraging Communications Electronic Command Software Engineering Center (CECOM SEC) to increase current capabilities and provide an increased performance capability version of the CHARCS software. CHARCS will conduct testing of the Nett Warrior End User device. CHARCS software requires development to keep pace with incremental technology improvements, Defense Intelligence Agency compliance, and to meet AROC approved requirements documented in the CHARCS CPD Increment 1, Revision 1. CHARCS is continuously evaluating and assessing existing Commercial-off-the-shelf (COTS) and Government-off-the-shelf (GOTS) that support CHARCS CPD Increment 1, Revision 1.

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 / 5					R-1 Program Element (Number/Name) PE 0604321A / All Source Analysis System				Project (Number/Name) B51 / Machine - Foreign Language Translation System			
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
B51: Machine - Foreign Language Translation System	-	1.067	1.176	1.500	-	1.500	5.535	2.062	2.101	2.164	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Machine Foreign Language Translation System (MFLTS) develops, fields, and sustains a basic automated foreign speech and text translation capability for Army tactical systems to augment and compliment limited human linguistic resources. These integrated automated translation capabilities will be applicable across three different system configurations; a hand-held/wearable portable device, a laptop/mobile device, and in a networked/web-enabled system. The software modules will translate English from a prioritized list of languages in a prioritized collection of domains (e.g. medical, intelligence, base security). MFLTS is interoperable with Commercial Off-The-Shelf (COTS) and Government Off-The-Shelf (GOTS) automation equipment to include the Distributed Common Ground System-Army (DCGS-A) and Nett Warrior, and will be interoperable with a future version of the CI/HUMINT Automated Reporting and Collection System (CHARCS).

FY18 base dollars in the amount of \$1.500 million provides for the program office support to the development and collection of prioritized Speech to Speech (S2S) and Text to Text (T2T) languages and domains.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Product Development and Engineering Support	0.614	0.709	0.772	-	0.772
Description: Development, integration and improvement of Critical Technology Elements (CTE) of Automated Speech Recognition (ASR), Optical Character Recognition (OCR), and Machine Language Translation Translation Engine (MLT TE) software. Includes incremental development of Speech to Speech (S2S) and Text to Text (T2T) languages and domains.					
FY 2016 Accomplishments: Completed development of the Iraqi Arabic and Pashto S2S languages and the Modern Standard Arabic (MSA) T2T language in the Checkpoint Operations and Base Security domains.					
FY 2017 Plans: Will provide for the planning of incremental development of Speech to Speech (S2S) and Text to Text (T2T) languages and domains.					
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 / 5	R-1 Program Element (Number/Name) PE 0604321A / All Source Analysis System	Project (Number/Name) B51 / Machine - Foreign Language Translation System

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Will provide for the development and collection of prioritized Speech to Speech (S2S) and Text to Text (T2T) languages and domains.					
Title: PD Support and Management Services Description: Program Office Support.	0.453	0.467	0.728	-	0.728
FY 2016 Accomplishments: Provided program management office support at Government activity sites.					
FY 2017 Plans: Will continue to provide program management office support at Government activity sites.					
FY 2018 Base Plans: Will provide program management office support at Government activity sites.					
Accomplishments/Planned Programs Subtotals	1.067	1.176	1.500	-	1.500

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
• B88605: Machine Foreign Language Translation System (MFLTS)	8.125	0.545	0.567	-	0.567	0.583	4.601	0.619	0.631	Continuing

Remarks

D. Acquisition Strategy
 The MFLTS Technology Development (TD) Phase developed an open software architecture prototype using full and open competition that allowed the addition, upgrade and replacement of translation system components for integration into existing Programs. During the Engineering and Manufacturing Development (EMD) Phase, the program integrated technology demonstrated during the TD Phase to meet Key Performance Parameters (KPPs). This included the requirement to meet an Interagency Language Roundtable (ILR) level of 1 for two speech translation modules and an ILR level of 1+ for one text translation module in hand-held/wearable portable, laptop/mobile, and networked/web-enabled system configurations. Milestone B was achieved 22 Jul 13 and an option period for the EMD phase contract was awarded 22 Jul 13. Following the Limited Deployment Decision (LDD), a contract was awarded to integrate and field MFLTS capability drop #1 in FY16. A full and open competition will result in the award of a contract(s) in FY18 for the incremental development of new MFLTS SW Capability Drops.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604321A / All Source Analysis System	Project (Number/Name) B51 / Machine - Foreign Language Translation System

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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604328A / <i>TRACTOR CAGE</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	-	15.138	12.525	17.252	-	17.252	18.540	19.520	19.897	20.355	Continuing	Continuing
C71: <i>Tractor Cage</i>	-	15.138	12.525	17.252	-	17.252	18.540	19.520	19.897	20.355	Continuing	Continuing

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	15.138	12.525	12.231	-	12.231
Current President's Budget	15.138	12.525	17.252	-	17.252
Total Adjustments	0.000	0.000	5.021	-	5.021
• 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	5.000	-	5.000
• Other Adjustments 1	0.000	0.000	0.021	-	0.021

Change Summary Explanation

The 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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</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	-	86.966	66.943	87.643	-	87.643	73.419	53.948	78.553	72.073	Continuing	Continuing
ES9: <i>Advanced Tactical Parachute System</i>	-	0.000	1.487	5.840	-	5.840	7.200	6.694	1.851	3.000	Continuing	Continuing
EW4: <i>Crew Served Weapons Engineering Development</i>	-	0.000	14.447	9.251	-	9.251	9.952	10.229	23.388	19.045	Continuing	Continuing
FF2: <i>Small Arms Fire Control</i>	-	0.000	0.000	20.117	-	20.117	20.418	9.067	8.259	11.388	0.000	69.249
FI2: <i>Lightweight 30mm Cannon</i>	-	0.000	0.000	5.500	-	5.500	0.000	0.000	0.000	0.000	0.000	5.500
S58: <i>Soldier Enhancement Program</i>	-	15.334	6.776	3.353	-	3.353	3.257	3.322	3.389	3.414	Continuing	Continuing
S60: <i>Clothing & Equipment</i>	-	5.814	10.166	7.022	-	7.022	5.413	7.528	8.803	5.075	Continuing	Continuing
S61: <i>Acis Engineering Development</i>	-	3.380	3.811	4.011	-	4.011	3.992	2.063	1.919	1.958	Continuing	Continuing
S62: <i>Counter-Defilade Target Engagement - SDD</i>	-	20.242	10.862	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
S63: <i>Individual Weapons Engineering Development</i>	-	22.377	11.801	6.961	-	6.961	6.616	7.013	21.711	17.600	Continuing	Continuing
S64: <i>Common Remotely Operated Wpn Sys (CROWS)</i>	-	3.952	4.331	22.500	-	22.500	9.300	0.000	0.000	0.000	Continuing	Continuing
S70: <i>Personnel Recovery Support System (PRSS)</i>	-	1.208	1.121	1.330	-	1.330	1.149	1.176	0.651	0.650	0.000	7.285
VS5: <i>Soldier Protective Equipment</i>	-	14.659	2.141	1.758	-	1.758	6.122	6.856	8.582	9.943	Continuing	Continuing

A. Mission Description and Budget Item Justification

Fiscal Year (FY) 2016 budget request funds Infantry Support Weapons. This Program Element (PE) Engineering and Manufacturing Development (EMD) manages the Soldier as a system, with the goal of increasing Soldiers' combat effectiveness, increasing survivability, and improving the Soldiers' quality of life. It develops and tests prototypes of weapons, clothing, equipment, and other items useful to support the Soldier.

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	
<p>Project ES9 (Advanced Tactical Parachute 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.</p> <p>Project EW4 (Crew Served Weapons Engineering) supports efforts to transition components or prototypes from Small Arms Improvement, Project S54, Program Element 0603827A, (Budget Activity 4) and other domestic and foreign sources of small arms weapons to demonstrate, test and evaluate capability near or at planned operational requirements.</p> <p>Project FF2 (Small Arms Fire Control (SAFC)) supports optimized fire control devices to support Squad (S), Crew Served (CS) and Precision (P). SAFC shall increase the probability of hit and decrease time to engage across a range of small arms weapon systems, with a direct-view optic that allows for quicker and more accurate target detection and recognition.</p> <p>Project FI2 (Lightweight 30mm Cannon) provides increased lethality modification to the Joint Light Tactical Vehicle (JLTV), it serves as the Infantry Brigade Combat Team (IBCT) light reconnaissance vehicle, an upgraded medium caliber weapon will be developed, tested and evaluated for integration into a modified remote weapon station.</p> <p>Project S58 (Soldier Enhancement Program) supports accelerated integration, modernization, and enhancement efforts of lighter, more lethal weapons, and improved Soldier items including lighter, more comfortable load-bearing equipment, field gear, survivability items, communications equipment, and navigational aids.</p> <p>Project S60 (Clothing and Equipment) supports pre-production development of state-of-the-art individual clothing and equipment to improve the survivability, mobility and sustainment affecting the quality of life of the individual Soldier.</p> <p>Project S61 (Aircrew Integrated Systems) provides System Development programs with improved aviator safety, survivability, and human performance that amplify the warfighting effectiveness and facilitates full-spectrum dominance of the Army aircraft including the AH-64 Apache/Longbow, CH-47 Chinook, UH/HH-60 Blackhawk, Light Utility Helicopter, and Armed Reconnaissance Helicopter.</p> <p>Project S62 (Counter-Defilade Target Engagement) the XM25, Individual Airburst Weapon System (IAWS) delivers a 25mm programmable high explosive airburst (HEAB) round to defeat defilade and point area targets out to approximately 600 meters. Accurate and lethal engagement of defilade targets at the squad level is the number one capability gap identified by the United States Army Infantry Center (USAIC).</p> <p>Project S63 (Small Arms Improvements) demonstrates engineering development models or integrated commercial items designed to enhance lethality, target acquisition, fire control, training effectiveness, and reliability for small arms weapon systems and ammunition. Programs include Improved Weapons Coatings, Personal Defense Weapon, 30 Round 5.56mm Magazine, Modular Handgun System (MHS), Precision Sniper Rifle (PSR), Sub Compact, and Interim Combat Service Rifle (ICR).</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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>
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Project S64 (CROWS) continues enhancing CROWS capability and reliability to increase its application across combat and tactical platforms. This capability enhances the Soldier's survivability, lethality and situational awareness.

Project S70 (Personnel Recovery Support System) provides system research, development and testing of the Personal Recovery Support System/Personnel Recovery Support Equipment supporting operations to report and locate isolated, missing, detained or captured Soldiers.

Project VS5 (Soldier Protective Equipment) supports engineering and manufacturing development of Individual Soldier Ballistic Protection equipment. It will leverage advancements in technology to continue incremental improvements to body armor (to include improved outer tactical vests, plate carriers, and helmets) and other personal protective equipment.

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	89.661	66.943	72.844	-	72.844
Current President's Budget	86.966	66.943	87.643	-	87.643
Total Adjustments	-2.695	0.000	14.799	-	14.799
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-2.695	0.000	14.799	-	14.799

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

Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604601A / Infantry Support Weapons				Project (Number/Name) ES9 / Advanced Tactical Parachute System			
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
ES9: Advanced Tactical Parachute System	-	0.000	1.487	5.840	-	5.840	7.200	6.694	1.851	3.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding line established in FY17 for the Advanced Tactical Parachute System. Efforts were previously executed in Program Element 0604601A S60.

A. Mission Description and Budget Item Justification

This funding supports engineering and manufacturing development tasks related to Static Line (SL) and Military Free Fall (MFF) personnel parachutes and auxiliary equipment with the goal of enhancing the insertion capability of the airborne soldier and increasing the performance, safety and durability of personnel airdrop equipment. Funds improvements and testing/evaluation of personnel parachute systems. Includes integration and interface on the Soldier system.

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

	FY 2016	FY 2017	FY 2018
Title: Advanced Tactical Parachute System	-	1.487	5.840
Description: Funds are a new Project established in FY17. Efforts were previously executed in Program Element 0604601A S60.			
FY 2017 Plans: Develop and test T-11 design and pack changes, develop Technical Manual (TM) updates and Modification Work Order (MWO) for the T-11R ripcord redesign. Prove out enhanced capability transitioned from ET8 to ensure viability in modernizing airdrop equipment across the airdrop portfolio to optimize parachutes and ancillary equipment for static line and military free fall parachutists.			
FY 2018 Plans: Efforts include enhanced capabilities transition from ET8 to include DT/OT, and purchasing contract data requirements for the Enhanced Electronic Automatic Activation Device (E/EAAD) for use with the RA-1 Advanced Ram Air Parachute System. Complete DT/OT for PARANAVSYS. Obtain MS C decision in 2QFY18 and Full Material Release (FMR) in 3QFY18 for PARANAVSYS. Procure test assets and conduct testing on T-11R (Reserve) improvements to optimize packing of both systems to reduce system profile and increase number of parachutists that can be carried on C-130 and C-17 aircraft. Conduct Operational Tests on and purchasing contract data requirements for the Enhanced Electric Automatic Activation Device (E/EAAD). Conduct developmental tests for Military Free Fall Altimeters. Conduct Salt Water immersion tests to determine impact on service life of RA-1. Conduct B-line riser collapse tests on RA-1. Parachutists Oxygen Delivery System (PODS) Testing to support Milestone C in FY2020.			
Accomplishments/Planned Programs Subtotals	-	1.487	5.840

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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 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) ES9 / <i>Advanced Tactical Parachute System</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>
• OPA, MA7801 ATPS: <i>Advanced Tactical Parachute System</i>	30.862	16.611	28.440	-	28.440	41.610	48.819	60.280	54.264	0.000	280.886
• RDTE, 643827ET8: <i>Personnel Airdrop System Development</i>	-	0.690	0.495	-	0.495	0.400	0.300	1.282	1.280	0	4.447

Remarks

D. Acquisition Strategy

Acquisition strategies for these programs vary in methods, and range from: 1) Material Change programs that result in engineering changes to existing systems to; 2) Traditional development programs that include an Engineering and Manufacturing Development phase ranging in duration from 12 to 48 months, depending on the level of complexity and testing required.

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 / 5					R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>				Project (Number/Name) EW4 / <i>Crew Served Weapons Engineering 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
EW4: <i>Crew Served Weapons Engineering Development</i>	-	0.000	14.447	9.251	-	9.251	9.952	10.229	23.388	19.045	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Element 0604601A / Infantry Support Weapons, EW4 / Crew Served Weapons Engineering Development Small Arms Fire Control effort has moved to FF2 / Small Arms Fire Control in FY2018 within the same Program Element.

New Start in FY2018: M2 Lightweight Program.

A. Mission Description and Budget Item Justification

The Crew Served Weapons Engineering and Manufacturing Development (EMD) program provides funds to transition components or prototypes from Small Arms Improvement, Project S54, Program Element 0603827A, (Budget Activity 4) and other domestic and foreign sources of small arms weapons to demonstrate, test and evaluate capability near or at planned operational requirements. Crew Served Weapons systems include weapons ranging up to 40 millimeter in caliber. Current and future efforts focus on system improvements designed to enhance lethality, target acquisition, 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 system development, integration (to include human-systems), demonstration, test and evaluate components, prototypes and operational system prototypes of small arms weapons and/or enhancements. Benefits include continuous improvements to small arms weapons, fire control equipment, optics, gun barrels, ancillary equipment, training devices, component mounts, weapon mounts, and weapon/ammunition interface of current small arms fleet or new weapon systems.

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

	FY 2016	FY 2017	FY 2018
Title: New Weapons	-	5.682	3.071
Description: Development of new crew served weapons			
FY 2017 Plans: FY2017 New Start. Transition of technologies from Program Element 0603827A S54: Next Generation Squad Automatic Rifle (NGSAR): Work to coordinate and develop the Capability Development Document (CDD), Acquisition Strategy, Capability Production Document (CPD), and provide data from various technologies to better inform stakeholders. Precision Sniper Rifle (PSR): Continue to work in conjunction with Special Operations Command (SOCOM) to 1) support development, acquisition and qualification of primary PSR anti-personnel ammunition and 2) perform acquisition and qualification efforts for PSR anti-materiel ammunition. Both rounds are necessary as a precursor for acquisition efforts slated in FY18 related to source selection activities of a new multi-caliber PSR weapon.			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) EW4 / <i>Crew Served Weapons Engineering Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>M3 Multi-Role Anti-Armor Anti-Personnel Weapon System (MAAWS): Complete operational and limited user test activities to obtain Type Classification and Full Material Release.</p> <p>FY 2018 Plans: Advanced Sniper Rifle (ASR) (formerly named Precision Sniper Rifle (PSR)): Will continue to support SOCOM in ASR full and open solicitation and bid sample test. Type Classified documentation preparation for both ASR rifle and new ammunition cartridges. Procurement of ASR systems to support Army specific qualification testing.</p> <p>New Weapon Evaluations and Assessments: Initial evaluation and assessment of new weapons.</p>			
<p>Title: Crew Served Weapons Enhancements</p> <p>Description: Enhancements and developments of Crew Served weapons</p> <p>FY 2017 Plans: The Gunner Integrated Protection and Restraint System (GIPRS): Improve the force protection, survivability, and effectiveness of the gunner and exposed crew by addressing capability gaps associated with open hatch operations in armored vehicles when exposed to enemy fires. The system integrates the Objective Gunner Protection Kit (OGPK), and Gunner Restraint System (GRS), fielded separately in support of Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). GIPRS improves current and future armored vehicles by providing the Army with an adaptive gunner and exposed crew protection capability, integrating the current inventory of machine guns, close combat missile systems, and target acquisition sensors.</p> <p>FY2017 New Start Increased Barrel Life: Transition of technologies from Program Element 0603827A Project S54. Complete refinement of drawing and specification package, build full length barrels for final qualification and safety confirmation testing. Perform testing at a Government facility.</p> <p>Compact Semi-Automatic Sniper System (CSASS): Conduct operational assessments and evaluations with a Limited User Test (LUT) as well as airborne drop testing. Complete Scoring Conference activities prior to release of the Operational Test Agency Milestone Assessment Report (OMAR). Complete provisioning activities and National Stock Number (NSN) assignment. Complete all documentation and prepare for MS-C /TC STD, Full Rate Production, and Full Material Release decisions in FY2017.</p> <p>Individual Non-Lethal System: Continue to test and evaluate technology and fine tune requirements and ensure all planning documentation is accurate and complete.</p>	-	5.150	4.464

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) EW4 / <i>Crew Served Weapons Engineering Development</i>

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

	FY 2016	FY 2017	FY 2018
<p>Sniper Upgrades: Perform feasibility, analysis of alternatives, and cost benefit analysis studies for various fire control and supporting precision enablers to include Shot Counter for Reliability and Maintainability (SCRAM) and cross wind sensing technologies. SCRAM is a system that collects a weapon's shock profile that is translated into diagnostic data to provide life cycle prognosis on individual weapon maintenance. It will increase a weapon life span and reduce maintenance cost and supports Condition Based Maintenance (CBM). Conduct barrel studies for improvements to reliability and accuracy that can be gained through new barrel materials and geometrics.</p> <p>Weapon Upgrades and Accessories: Test, evaluate and analyze ongoing and new activities to enhance Crew Served Weapons.</p> <p>FY 2018 Plans: New Start: M2 Lightweight Program - To investigate alternative materials (i.e. titanium) in order to lighten the Warfighter's load, to improve Soldier mobility, respond to vehicle weight restrictions, improve weapon parts life, increase durability and potentially increase performance. Will manufacture lightweight titanium weapon parts, will assemble improved parts into legacy weapons, conduct testing (production verification/reliability/user evaluation/air drop) on the improved weapon system and modify weapons based on test results.</p> <p>Increased Barrel Life: Continue to complete refinement of drawing and specification package, build full length barrels for final qualification and safety confirmation testing. Perform testing at a Government facility.</p> <p>Compact Semi-Automatic Sniper System (CSASS): Will continue to conduct operational assessments and evaluations with a Limited User Test (LUT) as well as airborne drop testing . Will complete Scoring Conference activities prior to release of the Operational Test Agency Milestone Assessment Report (OMAR). Complete provisioning activities and National Stock Number (NSN) assignment. Complete all documentation and prepare for MS-C /TC STD, Full Rate Production, and Full Material Release decisions in FY2018. May be used as the Squad Designated Marksman (SDM) materiel solution.</p> <p>M3 Multi-Role Anti-Armor Anti-Personnel Weapon System (MAAWS): Will complete operational and limited user test activities for the lightweight version M3E1, associated ammunitions and fire control to obtain Type Classification and Full Material Release.</p> <p>Individual Non-Lethal System: Will continue to test and evaluate technology and fine tune requirements and ensure all planning documentation is accurate and complete.</p> <p>Weapon Upgrades and Accessories: Will continue to test, evaluate and analyze ongoing and new activities to enhance Crew Served Weapons.</p>			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) EW4 / <i>Crew Served Weapons Engineering Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Small Business Innovation Research (SBIR) Enhancements: Will continue to support Phase II Enhancement and/or initialization of Phase III SBIR activities that transferred from Program Element 0604601A S63 within the same Program Element.			
<p>Title: Ammunition</p> <p>Description: Improvement of Crew Served Weapons Ammunition</p> <p>FY 2017 Plans: XM1112 Airburst Non-Lethal Munition (ANLM): Complete type classification and transition to Project Manager Close Combat Systems.</p> <p>Ammunition Upgrades: Continue to test, evaluate and analyze the effect of current and new ammunition on Crew Served Weapons. Specific focus on alignment of requirements between crew served fire control and 40mm air burst munition.</p> <p>FY 2018 Plans: Ammunition Upgrades: Will continue to test, evaluate and analyze the effect of current and new ammunition on Crew Served Weapons. Specific focus on alignment of requirements between crew served fire control and 40mm air burst munition.</p> <p>Will evaluate other M3/E1 MAAWs munitions such as the smoke and illuminating rounds currently used by SOCOM.</p>	-	0.100	0.226
<p>Title: Combat Optics</p> <p>Description: Improvement of Combat Optics</p> <p>FY 2017 Plans: Mounted Machinegun Optic: Continue staffing Capability Production Document (CPD) towards final approval and preparation for MDD for Program of Record. Continue to finalize TEMP, Acquisition Strategy/Acquisition Plan, and Production Readiness Review (PRR) for program execution. Work to prepare Procurement package, plan and develop Request for Proposals for down select. Contract award for initial source selection and down select.</p> <p>Optic Upgrades: Continue engineering evaluations, verification and validation of weapon optics performance requirements.</p> <p>FY 2018 Plans: Mounted Machinegun Optic: Will continue to finalize Test and Evaluation Master Plan (TEMP), Acquisition Strategy/Acquisition Plan, and PRR for program execution. Complete Procurement package, plan and develop Request for Proposals for down select. Contract award for initial source selection and down select. Develop Test Plan and conduct testing for first down select for further evaluation.</p>	-	0.500	1.390

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) EW4 / <i>Crew Served Weapons Engineering Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Optic Upgrades: Will continue engineering evaluations, verification and validation of weapon optics performance requirements.</p> <p>Title: Fire Control</p> <p>Description: Improvement of Crew Served Weapons fire control.</p> <p>FY 2017 Plans: Advanced Fire Control with Hyperspectral Target: Continue to assess, evaluate and test manufacturability and fire control system integration. Continue to conduct technical evaluations to determine if Advanced Hyperspectral Target Acquisition (AHTA) should be integrated within an Optics Suite of a Vehicle Mounted Weapon System (e.g. Common Remotely Operated Weapon System) or within the Optics of a Dismounted Weapon System or both.</p> <p>Advanced Fire Control with Precision Projectile/Dynamic: Continue to support integration of component advanced tracking technologies. Continue efforts to include initial integration of technologies including Contracting, System Requirements Review, System Functional Review, and preparations for Preliminary Design Review (PDR).</p> <p>Small Arms Fire Control - Precision (SAFC-P): Continue leveraging previously developed Sniper Rifle Fire Control (SRFC)/ Integrated Ballistic Reticle System (IBRS): Will continue efforts to tailor and qualify IBRS technology in order to address Fire Control System for Precision accuracy requirements identified in the Small Arms Fire Control Capability Development Document (CDD).</p> <p>Small Arms Fire Control - Crew Served (SAFC-C): Develop CDD for SAFC-CS.</p> <p>Fire Control Upgrades: Continue to test, evaluate, and analyze ongoing and new activities to enhance crew served weapons fire control.</p>		-	2.915	-
<p>Title: Research and Analysis</p> <p>Description: Market Research and Cost Benefit Analysis</p> <p>FY 2017 Plans: Continue Market Research and Cost Benefit Analysis of new small arms weapon and/or enhancements for engineering and manufacturing development.</p> <p>FY 2018 Plans:</p>		-	0.100	0.100

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) EW4 / <i>Crew Served Weapons Engineering Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Will continue Market Research and Cost Benefit Analysis of new small arms weapon and/or enhancements for engineering and manufacturing development.			
Accomplishments/Planned Programs Subtotals	-	14.447	9.251

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
• Advanced Development: RDTE S54, Program Element 0603827A - Soldier Systems	7.153	10.554	6.851	-	6.851	10.377	9.312	15.421	19.595	Continuing	Continuing
• Sniper Rifle MODS: WTCV, GZ1500, Sniper Rifle MODS	0.980	0.971	1.488	-	1.488	3.284	1.488	2.481	2.450	Continuing	Continuing
• M249 SAW MODS: WTCV, GZ1290, M249 Squad Automatic Weapon (SAW) MODS	1.190	1.179	3.339	-	3.339	3.959	4.526	3.444	-	Continuing	Continuing
• M240 Medium Machine Gun MODS: WTCV, GZ1300, M240 Medium Machine Gun MODS	1.708	1.784	4.577	-	4.577	7.002	7.156	6.292	5.406	Continuing	Continuing
• MK-19 Grenade Machine Gun MODS: WTCV, GB3000, MK-19 Grenade Machine Gun MODS	-	4.959	2.000	-	2.000	2.040	2.081	7.122	12.165	Continuing	Continuing
• M2 .50 CAL Heavy Machine Gun MODS: WTCV, GB4000, M2 .50 CAL Heavy Machine Gun MODS	43.720	48.582	47.414	-	47.414	37.567	11.703	10.916	3.333	Continuing	Continuing
• Modifications Less Than \$5.0M: WTCV, GC0925, Modifications Less Than \$5.0M	3.737	3.157	2.219	-	2.219	5.968	5.482	3.771	3.548	Continuing	Continuing
• Items Less Than \$5.0M: WTCV, GL32000, Items Less Than \$5.0M	3.408	2.331	5.075	-	5.075	1.235	1.697	2.978	3.000	Continuing	Continuing
• M240 Machine Gun: WTCV, G13000, M240 Machine Gun	7.000	-	1.992	-	1.992	-	-	-	-	Continuing	Continuing
• Compact Semi-Auto Sniper System: WTCV, G01507,	-	0.992	-	-	-	8.310	41.360	41.360	15.050	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) EW4 / <i>Crew Served Weapons Engineering 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>
<i>Compact Semi-Automatic Sniper System (CSASS)</i>											
• <i>Soldier Enhancement</i>	15.334	6.776	3.353	-	3.353	3.257	3.322	3.389	3.414	Continuing	Continuing
Program: <i>RDTE S58, Program Element 0654601 - Soldier Enhancement Program</i>											
• <i>Precision Sniper Rifle: WTCV, G015060, Precision Sniper Rifle</i>	-	-	-	-	-	-	9.500	13.500	15.500	Continuing	Continuing

Remarks

In support of Small Arms Requirements, components or prototypes developed in Small Arms Improvement, Project S54, Program Element 0603827A, (Budget Activity 4) is transitioned to Crew Served Weapons Engineering Development, Project EW4, Program Element 0604601A, (Budget Activity 5) to conduct engineering and manufacturing development. Once the component, prototype or operational prototype achieves Milestone C and type classification the item transitions to small arms weapon production or modification program.

D. Acquisition Strategy

Primary strategy is to mature and finalize design efforts, award Research, Development, Test and Evaluation (RDT&E) hardware contracts, and test and evaluate systems that result in type classification and follow-on production contract awards.

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 / 5					R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>				Project (Number/Name) FF2 / <i>Small Arms Fire Control</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
FF2: <i>Small Arms Fire Control</i>	-	0.000	0.000	20.117	-	20.117	20.418	9.067	8.259	11.388	0.000	69.249
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Small Arms Fire Control (SAFC) was previously funded under Projects S63 and EW4, Program Element (PE) 0604601A Infantry Support Weapons, and will transition to FF2 in FY2018 under the same PE.

A. Mission Description and Budget Item Justification

Small Arms Fire Control (SAFC) is a requirement for optimized fire control devices to support Squad (S), Crew Served (CS) and Precision (P). SAFC shall increase the probability of hit and decrease time to engage across a range of small arms weapon systems, with a direct-view optic that allows for quicker and more accurate target detection and recognition. The SAFC shall utilize an open system of systems architecture comprised of modular components, to deliver current ground forces the initial increased core capability followed by increasing increments of capability over time as technology matures. Small Arms Fire Control will culminate in three configurations: a Small Arms Fire Control - Squad (SAFC-S), Small Arms Fire Control - Crew Served (SAFC-CS), and Small Arms Fire Control - Precision (SAFC-P). They may include technology such as variable magnification direct view (day) optics, atmospheric sensors, an overlaid digital display, weapon orientation sensor, range determination, ballistic computer, disturbed reticle, and networked lethality. There are also other associated fire control efforts being worked simultaneously to include Advanced Individual Handheld Binocular (AIHB), Advanced Fire Control with Precision Projectile Tracking, and Small Arms Fire Control for 40mm Low Velocity.

FY2018 RDT&E funding in the amount of \$20.117 million will award a contract and provide for Government and contractor support to initiate the Engineering and Manufacturing Development Phases for the two (2) Fire Control configurations (SAFC-CS and SAFC-P). For all variants, FY2018 funding will be focused on contract award, initial design/early prototyping and bid sample testing. Other associated fire control efforts being worked simultaneously to include Multi-Spectral Imaging CROWS insertion, Advanced Individual Handheld Binocular (AIHB), Advanced Fire Control with Precision Projectile Tracking, and Small Arms Fire Control for 40mm Low Velocity.

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

	FY 2016	FY 2017	FY 2018
Title: Design, Develop and Fabricate	-	-	11.412
Description: Includes contract awards for the Engineering and Manufacturing Development of the three Fire Control configurations (SAFC-S, SAFC-CS and SAFC-P) and the Advanced Individual Handheld Binocular (AIHB).			
FY 2018 Plans: Multiple contract awards will begin the development and integration of various Fire Control configurations and development of initial prototypes. Initial prototypes will be delivered, system functional reviews will be conducted, and a design alternation plan will be established.			
Title: Engineering Support	-	-	3.530

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) FF2 / <i>Small Arms Fire Control</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Description: Government engineering support at lab/center, providing oversight of design development, integration and contractor performance.</p> <p>FY 2018 Plans: Will provide engineering support and oversight of design improvements and contractor performance. Will participate in source selection activities and technical reviews.</p>			
<p>Title: Test and Evaluation</p> <p>Description: Government testing and evaluation of Commercial Off The Shelf / Non-Developmental Item (COTS/NDI) items, prototypes, articles and improvements.</p> <p>FY 2018 Plans: Will develop test and evaluation criteria and documentation, testing of bid samples, and testing and evaluation of improvements and initial prototypes. Prototype systems will be tested both for technical capability as well as user evaluation. Will assess and evaluate incorporating existing target acquisition/fire control component technologies into binoculars. Recommendations for system improvement and improved acceptability will be generated.</p>	-	-	3.894
<p>Title: Program Management</p> <p>Description: Program management office, providing oversight of contract actions, engineering support and test activities.</p> <p>FY 2018 Plans: Will provide program oversight of design, development, integration and testing, to include contract actions, engineering support and test activities throughout the fiscal year.</p>	-	-	1.281
Accomplishments/Planned Programs Subtotals	-	-	20.117

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
• 0603827A: <i>Small Arms Improvement: RDTE S54</i>	7.153	10.554	6.851	-	6.851	10.377	9.312	15.421	19.595	Continuing	Continuing
• G17202000: <i>CREW SERVED SA-FC</i>	-	-	-	-	-	-	-	24.614	38.333	Continuing	Continuing
• G17203000: <i>Precision SA-FC</i>	-	-	-	-	-	-	2.650	18.095	31.880	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 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) FF2 / <i>Small Arms Fire Control</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

Small Arms Fire Control was previously funded on Program Element 0604601A Infantry Support Weapons, under Projects S63 and EW4.

D. Acquisition Strategy

The Small Arms Fire Control (SAFC) program will use an incremental developmental acquisition strategy.

The Small Arms Fire Control - Precision (SAFC-P) shall award one (1) Engineering and Manufacturing Development contract in FY2018 and a Production contract in FY2020. Total Approved Acquisition Objective (AAO) for the SAFC-P is 6,004 systems.

The Small Arms Fire Control - Crew Served (SAFC-CS) shall award up to three (3) Engineering and Manufacturing Development contracts in late FY2018, with a follow-on contract option to fully develop the system. A fixed-price Production contract shall be awarded in FY2020. Total Approved Acquisition Objective (AAO) for the SAFC-CS is 20,478 systems.

The Small Arms Fire Control - Squad (SAFC-S) shall award up to two (2) Engineering and Manufacturing Development contracts in FY2019, carrying both systems through Critical Design Review in FY2020. Iterative prototyping will be used to gather both technical and user feedback, and the continuous engineering improvement will be made on the system design. Based on test data and user feedback, a single vendor will be down-selected for Production option in FY2021. Total Approved Acquisition Objective (AAO) for the SAFC-S is 48,095 systems.

Additional Small Arms Fire Control Projects: Other associated Fire Control will be tested and evaluated simultaneously.

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 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) FF2 / <i>Small Arms Fire Control</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			
Engineering & Manufacturing Development Contract - Precision Fire Control	C/CR	TBD : TBD	0.000	-		-		5.193	Mar 2018	-		5.193	0.000	5.193	0.000
Engineering & Manufacturing Development Contract #1 - Crew Served Fire Control	C/CR	TBD : TBD	0.000	-		-		0.500	Sep 2018	-		0.500	0.000	0.500	0.000
Engineering & Manufacturing Development Contract #2 - Crew Served Fire Control	C/CR	TBD : TBD	0.000	-		-		0.500	Sep 2018	-		0.500	0.000	0.500	0.000
Engineering & Manufacturing Development Contract #3 - Other	C/CR	TBD : TBD	0.000	-		-		3.500	Mar 2018	-		3.500	0.000	3.500	0.000
Subtotal			0.000	-		-		9.693		-		9.693	0.000	9.693	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 Support	MIPR	US Army Armament Research, Development and Engineering Center (ARDEC) : Picatinny Arsenal, NJ	0.000	-		-		3.530	Oct 2017	-		3.530	0.000	3.530	0.000
Program Management	Allot	Project Manager Soldier Weapons (PMSW) : Picatinny Arsenal, NJ	0.000	-		-		1.500	Oct 2017	-		1.500	0.000	1.500	0.000
Contractor Support	C/FFP	TBD : TBD	0.000	-		-		1.500	Oct 2017	-		1.500	0.000	1.500	0.000
Subtotal			0.000	-		-		6.530		-		6.530	0.000	6.530	0.000

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) FF2 / <i>Small Arms Fire Control</i>
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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			
Test and Evaluation	MIPR	US Army Test and Evaluation Command (ATEC) : Aberdeen Proving Ground, MD	0.000	-		-		1.419	Jan 2018	-		1.419	0.000	1.419	0.000
Test and Evaluation	MIPR	US Army Tank and Automotive Command (TACOM) : Warren, MI	0.000	-		-		0.850	Nov 2017	-		0.850	0.000	0.850	0.000
Test and Evaluation	MIPR	Maneuver Battle Lab, US Army Maneuver Center of Excellence : FT Benning, GA	0.000	-		-		0.800	Oct 2017	-		0.800	0.000	0.800	0.000
Test and Evaluation	MIPR	White Sands Missile Range : White Sands Missile Range, NM	0.000	-		-		0.825	Nov 2017	-		0.825	0.000	0.825	0.000
Subtotal			0.000	-		-		3.894		-		3.894	0.000	3.894	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		20.117		-		20.117	0.000	20.117	0.000

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) FF2 / <i>Small Arms Fire Control</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
Engineering & Manufacturing Development - Small Arms Fire Control - P																												
Engineering & Manufacturing Development - Small Arms Fire Control - C																												
Engineering & Manufacturing Development - Small Arms Fire Control - S																												
Additional Small Arms Fire Control Projects																												

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) FF2 / <i>Small Arms Fire Control</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Engineering & Manufacturing Development - Small Arms Fire Control - Precision	1	2018	2	2020
Engineering & Manufacturing Development - Small Arms Fire Control - Crew Served	1	2018	3	2020
Engineering & Manufacturing Development - Small Arms Fire Control - Squad	1	2019	2	2021
Additional Small Arms Fire Control Projects	1	2018	4	2022

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>				Project (Number/Name) F12 / <i>Lightweight 30mm Cannon</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
F12: <i>Lightweight 30mm Cannon</i>	-	0.000	0.000	5.500	-	5.500	0.000	0.000	0.000	0.000	0.000	5.500
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is a new start in FY2018.

A. Mission Description and Budget Item Justification

In support of an Army directed requirement (reference DAPR-ZA Memorandum, dated 5 July 2016) to provide an increased lethality modification to the Joint Light Tactical Vehicle (JLTV), to serve as the Infantry Brigade Combat Team (IBCT) light reconnaissance vehicle, an upgraded medium caliber weapon will be developed, tested and evaluated for integration into a modified remote weapon station.

The XM914 is an upgraded and modified version of the M230 cannon currently equipped on the AH-64 Apache advanced attack helicopter. The XM914 is a link fed, externally powered and electrically primed 30mm chain gun, capable of firing two hundred rounds per minute. The gun incorporates an anti-hangfire system and an extended barrel for enhanced muzzle velocity. The XM914 provides significant lethality improvements over the current M2 .50 caliber machine gun and MK19 grenade machine gun and provides the capability required for Soldiers in a combat environment to engage enemy personnel and light armored targets.

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

	FY 2016	FY 2017	FY 2018
Title: Contractor Design and Prototype Fabrication	-	-	3.600
Description: Includes contractor design, development and prototype fabrication for engineering and manufacturing development of the XM914 30mm autocannon.			
FY 2018 Plans: Contractor will begin work on the design and development effort for the XM914 30mm autocannon. Initial prototypes of the weapon and test hardware will be purchased to conduct safety and limited reliability testing.			
Title: Engineering Support	-	-	1.150
Description: Government engineering support at lab/center, providing design, limited testing and oversight of development and contractor performance.			
FY 2018 Plans: Will provide design and development input, oversight of contractor performance, and participation in technical reviews.			
Title: Test and Evaluation	-	-	0.500
Description: Government testing and evaluation of weapon prototype, articles and system improvements.			

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) F12 / <i>Lightweight 30mm Cannon</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p><i>FY 2018 Plans:</i> Will conduct initial testing with prototype weapons acquired during assessment. Will develop test and evaluation plans, criteria and documentation. Recommendations for system improvement will be generated.</p> <p><i>Title:</i> Program Management</p> <p><i>Description:</i> Program management office provides oversight of contract actions, engineering support and test activities.</p> <p><i>FY 2018 Plans:</i> Will provide program oversight of design, development, integration and testing, to include contract actions, engineering support and test activities throughout the fiscal year.</p>	-	-	0.250
Accomplishments/Planned Programs Subtotals	-	-	5.500

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
• GUN AUTOMATIC 30MM M230: <i>W&TCV, G13800, M230</i>	-	-	-	-	-	7.500	20.000	10.000	-	0	37.500
• CROWS G04700: <i>W&TCV, G04700, M153</i>	40.500	25.164	0.750	-	0.750	2.500	20.000	20.000	-	0	108.914
• CROWS 0604601 / S64: <i>RDT&E, 0604601 / S64</i>	3.952	4.331	22.500	-	22.500	9.300	-	-	-	0	40.083

Remarks

D. Acquisition Strategy

The XM914 is currently considered a non-standard weapon that is being sold commercially to foreign customers by the vendor. As a modified version of the M230 30mm chain gun for the AH-64 Apache advanced attack helicopter, the XM914 requires safety confirmation/safety release and weapon qualification for vehicle mounted platforms. In order to meet the Urgent Materiel Release (UMR) requirement of nine (9) systems by FY19 (and the remaining 243 systems to follow), a sole source contract based on urgency will be pursued for a period of performance of one (1) year. A long term Indefinite Delivery/Indefinite Quantity (IDIQ) type contract will be pursued for the year to follow.

The program supports new and emerging urgent requirements for the Joint Light Tactical Vehicle Directed Requirement and will support integration with the Remote Weapon Station on the vehicle or other platforms.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) F12 / <i>Lightweight 30mm Cannon</i>
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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 / 5					R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>				Project (Number/Name) S58 / <i>Soldier Enhancement Program</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
S58: <i>Soldier Enhancement Program</i>	-	15.334	6.776	3.353	-	3.353	3.257	3.322	3.389	3.414	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Description: The Soldier Enhancement Program (SEP) was established by the Fiscal Year 1990 National Defense Authorization Act. SEP provides an enduring process that includes procurement and evaluation of Commercial Off the Shelf (COTS)/Non-Developmental Item (NDI)/Government Off The Shelf (GOTS) items that have the potential to enhance Army Infantryman's and Soldiers' ability to execute their combat mission. In contrast to the traditional acquisition cycle, SEP provides significant savings and acceleration of testing and evaluation of items. The SEP program is managed jointly by Program Executive Office (PEO) Soldier and the U.S. Army Training and Doctrine Command (TRADOC) Maneuver Center of Excellence (MCoE). SEP suggestions are submitted by individual Soldiers, Field Commanders, commercial manufacturers, and others via the PEO Soldier SEP website. Viable suggestions are vetted by a Council of Colonels (CoC) and validated as SEP initiatives by Director, Capabilities, Integration, Prioritization and Analysis (DAMO-CI). Validated SEP initiatives are procured in limited quantities for evaluation and testing of feasibility and suitability. Based on the evaluation findings, the SEP CoC provides one or more of the following courses of action: (1) no further action, (2) item did not meet objectives, (3) inform deliberate or urgent/emergent requirements generation, (4) initiate a new Program of Record (POR), (5) improve an existing POR, (6) transition to the Rapid Equipping Force (REF), or (7) add to the Rapid Fielding Initiative (RFI) list.

Justification: FY18 RDT&E funding supports SEP evaluations and documentation of results.

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

	FY 2016	FY 2017	FY 2018
Title: Soldier Enhancement Program (SEP) Evaluations	4.828	6.255	2.821
Description: Procured and evaluated COTS/GOTS/NDI items that have the potential to enhance Soldier combat effectiveness.			
FY 2016 Accomplishments: Evaluated 27 SEP initiatives. Product evaluations included safety testing, collection, analysis of user feedback and documentation of results.			
FY 2017 Plans: Funding will support evaluation of approximately 30 new initiatives. Evaluations will include safety testing, collection, and analysis of user feedback/results and documentation of results.			
FY 2018 Plans: Funding will support evaluation of approximately 25 initiatives. Product evaluations will include safety testing, collection, and analysis of user feedback/results and documentation of results.			
Title: Soldier Enhancement Program Evaluations	10.000	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S58 / <i>Soldier Enhancement Program</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Description: Additional funding will support evaluation of SEP initiatives.</p> <p>FY 2016 Accomplishments: Evaluated 41 SEP initiatives. Evaluations included safety testing, collection, analysis of user feedback and documentation of results.</p>			
<p>Title: Systems Engineering and Program Management.</p> <p>Description: Systems Engineering and Program Management.</p> <p>FY 2016 Accomplishments: Received and reviewed incoming proposals. Coordinated with industry and TRADOC to ensure that submitted proposals satisfied user needs. Evaluated SEP initiatives will received a recommendation to either inform a requirement, transition to an existing POR or were included in the GSA and/or DLA catalogs for future procurements.</p> <p>FY 2017 Plans: The SEP team will continue to receive and review incoming proposals. Coordination with industry and TRADOC to ensure submitted proposals will continue to satisfy needs. Evaluated SEP initiatives will receive a recommendation to either inform a requirement, transition to an existing Program of Record or be included in the GSA and/or DLA catalogs for future procurements.</p> <p>FY 2018 Plans: Upon conclusion of soldier evaluations, the SEP team will receive and review incoming proposals. The team will coordinate with industry and TRADOC to ensure submitted proposals satisfy Army needs. Will continue to evaluate SEP initiatives and provide recommendations.</p>	0.506	0.521	0.532
Accomplishments/Planned Programs Subtotals	15.334	6.776	3.353

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
• OPA3 MA6800: <i>Soldier Enhancement - Other Support Equipment - MA6800</i>	2.287	2.112	1.095	-	1.095	1.117	1.139	1.162	1.175	Continuing	Continuing
• OPA2 BA5300: <i>Soldier Enhancement - Comms & Electronics Equipment - BA5300</i>	0.349	-	-	-	-	-	-	-	-	0	0.349
• AMMO: <i>Soldier Enhancement Program (SEP) Ammo</i>	-	0.341	0.248	-	0.248	0.255	0.262	0.269	0.274	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 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S58 / <i>Soldier Enhancement Program</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>
• WTCV GC0076: <i>Soldier Enhancement - Smalls Arms Weapons - GC0076</i>	2.392	3.155	1.573	-	1.573	1.654	1.688	1.721	1.753	Continuing	Continuing

Remarks

D. Acquisition Strategy

SEP focuses on COTS/GOTS/NDI initiatives submitted by Soldiers and industry. SEP proposals are reviewed and approved semi-annually. Procurement funds SEP COTS/GOTS/NDI items for evaluation. Research, Development, Test and Evaluation is used to conduct product evaluations which includes safety testing, data collection, analysis of Soldier feedback/results and documentation of results.

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 / 5					R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>				Project (Number/Name) S60 / <i>Clothing & 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
S60: <i>Clothing & Equipment</i>	-	5.814	10.166	7.022	-	7.022	5.413	7.528	8.803	5.075	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding supports engineering and manufacturing development tasks related to individual clothing, equipment and personnel parachutes with the goal of enhancing the survivability, mobility and quality of life of the individual Soldier. It funds system integration and formal Developmental Testing/Operational Testing of preproduction and production representative systems leveraging advancements in materials, fabrication techniques, moisture management, flame resistance, antimicrobial treatments, insect protection, extreme environmental protection and chemical/biological protection and camouflage, to include evaluation, test, and conduct of Soldier evaluations of Organizational Clothing and Individual Equipment appropriate for use in jungle/tropical and Arctic environments. Goal is to increase the capabilities and durability of tactical and non-tactical clothing and individual equipment. Includes integration and interface on the Soldier system. It also funds improvements and testing/evaluation of personnel parachute systems through FY16.

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

	FY 2016	FY 2017	FY 2018
Title: Soldier Uniforms and Clothing	4.168	4.000	5.820
Description: Develop and provide superior and sustainable integrated clothing for the Soldier in a rapidly changing global environment.			
FY 2016 Accomplishments: Uniform Clothing and Environmental Clothing System. Established shade standards for fabrics and components used in Operational Camouflage Pattern (OCP) organizational clothing. Purchased test assets of improved fabrics for reduced weight of winter overwhites.			
Flame Resistant Clothing. Initiated developmental test of Government designed/owned Knee Pad for the Army Combat Pants.			
Clothing Bag. Continued to refine designs and incorporate alternate materials and designs in clothing bag items including the Women's Army Service Uniform (ASU) cape, and alternate fabrics for the Army Physical Fitness Uniform (APFU).			
FY 2017 Plans: Conduct Limited User Evaluation to support Army decision on the Jungle Combat Boot. Conduct limited user evaluation on White Dress Shirts using two best fabrics transitioning from S-53. Develop female variant Army Combat Shirt to support deploying female Soldiers. Conduct female fit sizing study for Army Combat Boots. Develop a Berry Amendment-compliant purchase description for an athletic shoe to be fielded to initial entry Soldiers. Incorporate sizing modification and material improvements			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S60 / <i>Clothing & Equipment</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>to better utilize the Poncho Liner with the Field Tarp. Plans to continue to refine designs and incorporate alternate materials into clothing bag items.</p> <p>FY 2018 Plans: Uniform Clothing and Environmental Clothing System. Conduct user evaluations on the environmental protective clothing (includes torso and extremity protection) to support a MS C in 4QFY19. Obtain MS C decision for Jungle Boots in 4QFY18. Complete user evaluation for Flame Resistant Fuel Handlers Coveralls to support material change proposal.</p> <p>Complete NDAA-directed testing to develop Purchase Description for Berry Amendment-compliant clothing bag running shoe. Flame Resistant Uniforms: Conduct user evaluation on uniforms made from improved FR materials.</p> <p>Plans to continue to refine designs and incorporate alternate materials into clothing bag items.</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: NBC/Load Carriage. Conducted developmental test and evaluation of MOLLE 4000 rucksack with airborne units. Completed Individual Water Treatment Device (IWTD) P248 standard testing.</p> <p>Airdrop. Conducted bench top testing of updated PARANAVSYS software (v 2.0) with new Nett Warrior End User Device and new Soldier Radio. After program initiation for the Electronic EEAD Program of Record, procured design validation assets and conducted DT to support a MS C in 1QFY18. Conducted tests on the ripcord design and pack tray of the T-11 Reserve (R) parachute to reduce potential of accidental activation. Procured prototype T-11 main canopies and conducted Developmental Testing of revised packing procedures and redesigned corner vent panels to reduce corner vent inversions. Developed prototypes and test redesigned RA-1 Main Riser Trim Straps and Reserve Pilot Chute Spring. Tested updated air permeability treatments for RA-1 canopies to support new production contract award. Conducted Mean-Time-Between-Failure (MTBF) tests of MC-6 and T-11 parachutes to determine if the service life of these parachutes could be extended.</p> <p>FY 2017 Plans: NBC/Load Carriage/Hydration: Procure samples and conduct live chemical agent testing for the Multi-Purpose Hydration System (MPHS) to increase operational life to reach 365 days once placed into service in an operational environment. Procure samples and conduct testing of tactical holster to be fielded with the new Modular Handgun System. Conduct technical testing of DT/OT</p>		1.646	6.166	1.202

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S60 / <i>Clothing & Equipment</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
on IWTD candidates. Conduct limited user evaluation and abbreviated P248 testing to support MS-C for the Individual Water Treatment Device (IWTD).			
<i>FY 2018 Plans:</i> NBC/Load Carriage/Hydration: Investigate enhancements to improve the capability to hydrate in a combat environment. Complete live agent testing for on the move hydration to increase operational life once placed into service in combat environment and conduct second year of five year live agent test protocol to extend shelf-life of hydration systems.			
Accomplishments/Planned Programs Subtotals	5.814	10.166	7.022

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
• Clothing and Individual Eqp S53: <i>RDTE, 0603827.S53, Clothing and Equipment</i>	9.758	3.582	2.612	-	2.612	1.845	2.495	1.831	2.445	Continuing	Continuing
• Central Funding and Fielding: <i>OMA, 121017, Central Funding and Fielding</i>	36.649	37.748	-	-	-	-	-	-	-	Continuing	Continuing
• Advanced Tactical Parachute System: <i>OPA, MA7801, Advanced Tactical Parachute System</i>	26.088	16.611	28.440	-	28.440	41.610	48.819	60.280	54.264	Continuing	Continuing
• Force Readiness Operations Support: <i>OMA, 121018, Force Readiness Operations Support</i>	-	-	79.417	-	79.417	38.000	39.800	39.100	40.113	0	236.430

Remarks

D. Acquisition Strategy
Acquisition strategies for these programs vary in methods, and range from: 1) Material Change programs that result in engineering changes to existing systems to; 2) Traditional development programs that include an Engineering and Manufacturing Development phase ranging in duration from 12 to 48 months, depending on the level of complexity and testing required.

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 / 5					R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>				Project (Number/Name) S61 / <i>Acis Engineering 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
S61: <i>Acis Engineering Development</i>	-	3.380	3.811	4.011	-	4.011	3.992	2.063	1.919	1.958	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project conducts Engineering and Manufacturing Development (EMD) for the Air Soldier System (Air SS). The Air SS is Army aircrew survival and mission equipment that improves safety, survivability, and human performance. The Air SS Capability Development Document (CDD) addresses capability gaps identified during sustained combat operations in Iraq and Afghanistan including inadequate crew station compatibility caused by equipment bulk, aircraft mishaps as a result of limited Situational Awareness (SA), and lack of functionally integrated aircrew mission and survival equipment. Air SS delivers reduced bulk and weight of survival equipment; improved crew station compatibility; and improved pilot SA and safety. The Air SS provides enhanced terrain, threat, and obstacle avoidance information; improved heads-up display (HUD) technologies that increase the aviator's ability to safely operate in Degraded Visual Environments (DVE) using Three Dimensional conformal symbology; a Helmet Display and Tracking System (HDTs); the capability to perform extended missions in extreme environmental and chemical/biological threat conditions; the capability to digitally replace paper-based DoD Flight Information Publications (Electronic Flight Bag); and develops and tests a modernized replacement for the Air Warrior survival vest that integrates with Soldier Protection System body armor (Aircrew Combat Ensemble). This project also funds the development and test of deferred CDD capabilities including improved laser eye protection and tactile cueing that enhances aviator SA in a DVE. This program does not duplicate any aircraft platform program efforts. 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) Engineering Development	3.380	3.811	4.011
Description: Development, Integration, evaluation, testing, and qualification of Air Soldier System multi-phased capabilities as technologies mature.			
FY 2016 Accomplishments: Continued integration and Developmental Test of the Air SS in the UH-60L; continued evaluation of P3I candidate commercial products focusing on an Electronic Flight Bag (EFB) solution including market research and performance demonstration of available Commercial Off the Shelf (COTS) devices.			
FY 2017 Plans: Continued evaluation, modification, integration, and qualification of P3I candidate commercial products. Primary focus will be on the detailed design and qualification of a COTS or modified COTS EFB tablet, including formal developmental and operational flight testing scheduled to begin in Fiscal Year (FY) 2017. Other activities will include market research and preliminary evaluation of candidate technologies for applicability to Air SS requirements for improved laser eye protection, integrated soldier power, and/or wireless personal networks.			
FY 2018 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S61 / <i>Acis Engineering Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
FY 2018 Plans: Conduct Operational Test of the Air SS in the UH-60L and complete integration, qualification, and operational test of the Electronic Flight Bag, and continue integration, test, and qualification of the Aircrew Combat Ensemble.			
Accomplishments/Planned Programs Subtotals	3.380	3.811	4.011

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
• Aircrew Integrated Sys Adv Dev: <i>RDTE, A PE</i> <i>0603827A, PROJ S51 - Adv Dev</i>	0.146	-	-	-	-	-	-	-	-	0	0.146
• 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

Engineering and Manufacturing Development efforts for the Air SS program include development, integration, test, and airworthiness qualification of aviator flight display symbology technologies that will increase crew member situational awareness in DVE, and aircrew protective and survival equipment that reduces bulk and weight and improves crew station compatibility and mission effectiveness. Air SS includes improvements to the current flight helmet; improvements to the survival gear carriage system; lightweight body armor; environmental protective clothing and personal survival equipment; and a day/night helmet-mounted flight symbology display with head tracking and 3D conformal flight symbology for UH-60 and CH-47 aviators. The Air SS P3I phase includes the development and qualification of the EFB, a digital Army aviation replacement for paper-based DoD Flight Information Publications, and the Aircrew Combat Ensemble (ACE), a replacement for the current Air Warrior survival vest that will further reduce weight and bulk, accommodate migration to the Army's new Soldier Protection System (SPS) modular ballistic protection system, and enhance compatibility and stowage/interface provisions for current and future clothing and individual survival equipment. P3I efforts also continue to develop deferred capabilities as defined within the Capability Development Document (CDD) to include tactile Situational Awareness enhancements and enhanced laser eye protection. Contracts with industry include both Cost and Firm Fixed Price using full and open competition, each evaluated and selected to appropriately share risk between industry and the government.

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 / 5					R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>				Project (Number/Name) S62 / <i>Counter-Defilade Target Engagement - SDD</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
S62: <i>Counter-Defilade Target Engagement - SDD</i>	-	20.242	10.862	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

The Maneuver Center of Excellence (MCoE), FT Benning, GA (User Community) identifies the Counter Defilade Target Engagement (CDTE) as a critical capability gap for our Soldiers in combat. The number one materiel solution to mitigate the critical capability gap (defeating defilade (hidden) targets from 35-500m) is the XM25. The XM25 provides the Infantry Soldier with a leap-ahead overmatch capability that dramatically increases lethality, range, and capability through the use of a family of programmable 25mm ammunition and allows the Soldier to engage defilade targets with a high degree of accuracy while posing minimal burden, in terms of weight and size. The XM25 fires 25mm munitions including high-explosive airburst (HEAB) and training rounds. The XM25 comes with a target acquisition/fire control subsystem that integrates thermal capability with direct-view optics, laser rangefinder, environmental sensors, fuze setter, ballistic computer, and internal display. The XM25 has a 500-meter point target range and a 800-meter area target range capable of defeating defilade targets.

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

	FY 2016	FY 2017	FY 2018
<p>Title: Engineering and Manufacturing Development/Fabricate</p> <p>Description: Description: Engineering Development and Fabrication</p> <p>FY 2016 Accomplishments: Conducted pre Milestone C system level trade studies and design reviews to improve system effectiveness and reliability. Implemented design modifications to address issues identified during contractor and government testing. Explored Engineering Change Proposals (ECPs) to potentially reduce weight, size, and power consumption.</p> <p>FY 2017 Plans: Complete build of hardware to support contractor and government testing. Will continue to implement modifications and explore additional engineering changes to potentially reduce weight, size, and power consumption.</p>	16.179	7.236	-
<p>Title: Engineering and Training Development</p> <p>Description: Description: Engineering and Training Development</p> <p>FY 2016 Accomplishments:</p>	0.860	0.430	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S62 / <i>Counter-Defilade Target Engagement - SDD</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Provided engineering support for weapons systems, subsystems, target acquisition/fire control (TA/FC), ammunition and software design modifications based on lessons learned from contractor testing. Provided engineering support for the development of the XM25 virtual training concept.</p> <p>FY 2017 Plans: Continue to provide engineering support for weapons systems, subsystems, target acquisition/fire control (TA/FC), ammunition and software design modifications. Will complete training material based on lessons learned during user assessments, Soldier training and log demo activities. Will provide engineering support to complete the development of the virtual training concept for the XM25.</p>				
<p>Title: Development / Operational Test and Evaluation Activities</p> <p>Description: Description: Test and Evaluate</p> <p>FY 2016 Accomplishments: Initiated PPQT#2 consisting of government test efforts to evaluate engineering changes, fixes and design modifications to address anomalies. Conducted Design Verification Testing, planned and coordinated Low Rate Initial Production (LRIP), Production Qualification Testing (PQT), and Logistics Demonstrations (Log Demo).</p> <p>FY 2017 Plans: Conduct PQT of LRIP quantities consisting of government test efforts to evaluate weapon system and TA/FC design and production maturity. Will also conduct Limited User Testing (LUT), LFT&E, and the final log demo.</p>		2.172	2.950	-
<p>Title: Program Management</p> <p>Description: Description: Program Management</p> <p>FY 2016 Accomplishments: Provided program management, logistical and life cycle support, to organize, coordinate and control program activities in preparation for Milestone C.</p> <p>FY 2017 Plans: Provide program management, logistical and life cycle support, to organize, coordinate and control program activities through Low Rate Initial Production (LRIP).</p>		1.031	0.246	-
Accomplishments/Planned Programs Subtotals		20.242	10.862	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S62 / <i>Counter-Defilade Target Engagement - SDD</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>	
• G16101: <i>(G16101) Integrated Air Burst Weapon System Family</i>	-	9.764	-	-	-	-	-	-	-	-	Continuing	Continuing
• E92500: <i>(E92500) CTG, 25MM, XM1083 High Explosive Air Burst (HEAB)</i>	-	0.198	-	-	-	-	-	-	-	-	Continuing	Continuing
• E92510: <i>(E92510) CTG, 25MM, XM1081 Target Practice (TP)</i>	-	-	-	-	-	-	-	-	-	-		

Remarks

D. Acquisition Strategy

The XM25 transitioned from the Technology and Development phase to Engineering and Manufacturing Development (EMD) phase by achieving Milestone B in December 2010. The EMD phase completes development of the XM25 and verifies training solutions for the Milestone C approval currently scheduled for 2QFY17. The Research and Development acquisition strategy is to use sole source contracting with Orbital ATK (formerly known as Alliant Techsystems), Plymouth, MN. Contract is in the process of being Terminated for Default as of 5 April 2017. The default was caused by Heckler and Kotch GmbH (the weapon subcontractor) refusing to deliver 20 already built and purchased weapon subsystems. Orbital ATK and L3 were ready to deliver the ammunition and Fire Controls to the government. Orbital ATK has appealed to the Armed Services Board of Contract Appeals, which may impact the default status."

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 / 5					R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>				Project (Number/Name) S63 / <i>Individual Weapons Engineering 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
S63: <i>Individual Weapons Engineering Development</i>	-	22.377	11.801	6.961	-	6.961	6.616	7.013	21.711	17.600	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Element 0604601A Project S63 - Infantry Support Weapons is renamed Program Element 0604601A Project S63 - Individual Weapons Engineering Development

Program Element 0604601A / Infantry Support Weapons, S63 / Individual Weapons Engineering Development Small Arms Fire Control effort has moved to FF2 / Small Arms Fire Control in FY2018 within same Program Element.

FY2018 New Starts include Interim Combat Service Rifle (ICSR).

A. Mission Description and Budget Item Justification

The Small Arms Improvement Engineering and Manufacturing Development (EMD) program provides funds to transition components or prototypes from Small Arms Improvement, Project S54, Program Element 0603827A, (Budget Activity 4) and other domestic and foreign sources of small arms weapons to demonstrate, test and evaluate capability near or at planned operational requirements. Small arms systems include weapons ranging up to 40 millimeter in caliber. Current and future efforts focus on system improvements designed to enhance lethality, target acquisition, 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 system development, integration (to include human-systems), demonstration, test and evaluate components, prototypes and operational system prototypes of small arms weapons and/or enhancements. Benefits include continuous improvements to small arms weapons, fire control equipment, optics, gun barrels, ancillary equipment, training devices, component mounts, weapon mounts, and weapon/ammunition interface of current small arms fleet or new weapon systems.

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

	FY 2016	FY 2017	FY 2018
Title: New Weapons	9.975	9.025	6.661
Description: Description: Development of new weapons			
FY 2016 Accomplishments:			
Modular Handgun System (MHS): Provided responses to industry questions regarding the final MHS solicitation. Funded the Integrated Product Team (IPT), closed the final solicitation. Completed, staffed and approved test plans for all Bid Sample Test (BST), and held three Test Readiness Reviews in preparation for technical testing, user testing, and lethality test and evaluation protocol. Completed bid sample testing and Early Warfighter Acceptance assessments of the weapon systems and ammo.			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S63 / <i>Individual Weapons Engineering Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Initiated source selection activities. Completed staffing of documentation required for MS-C decision and briefed MS-C Decision Authority and Army Acquisition Executive (AAE). MS-C achieved.</p> <p>M3 Multi-Role Anti-Armor Anti-Personnel Weapon System (MAAWS): Completed required acquisition documents for Conditional Materiel Release of M3 weapon and Army adopted 84mm ammunition. Validated the Type Classification exemption per Army Regulation 700-142 for the ammunition. Conducted operational test and evaluation activities on the system. Drafted and staffed required acquisition safety and sustainment documentation necessary to Type Classify the M3 weapon system. In parallel with the M3 Type Classification effort, the IPT prepared some of the necessary documentation in support of Full Materiel Release of the weapon and ammunition. Transitioned within the same Program Element to EW4 in FY2017.</p> <p>Precision Sniper Rifle (PSR): Continued to work in conjunction with Special Operations Command (SOCOM) to 1) support development, acquisition and qualification of primary PSR anti-personnel ammunition and 2) perform acquisition and qualification efforts for PSR anti-materiel ammunition. Both rounds are necessary as a precursor for acquisition efforts in FY2018 for a new multi-caliber PSR weapon. Transitioned within the same Program Element to EW4 in FY2017.</p> <p>Squad Designated Marksman Rifle (SDM): Continue to inform requirements and the Doctrine, Organization, Training, Materiel, Leadership & Education, Personnel, and Facilities (DOTMLPF) analysis. Continue to develop Acquisition Strategy and initiate execution.</p> <p>FY 2017 Plans: Modular Handgun System (MHS): Continue source selection activities to narrow the competitive range. Award contract for COTS/NDI weapon systems and ammunition. Perform second Logistic Demonstration and begin the ammunition energetic materials qualification testing. Conduct verification, validation, Joint CONOP and limited user test activities to facilitate down selecting to one (1) vendor. Continue to fund the IPT and prepare Type Classification documentation.</p> <p>Squad Designated Marksman Rifle (SDM): Continue to inform requirements and the Doctrine, Organization, Training, Materiel, Leadership & Education, Personnel, and Facilities (DOTMLPF) analysis. Continue to develop Acquisition Strategy and initiate execution.</p> <p>FY 2018 Plans: Modular Handgun System (MHS): Will continue Production Verification Test activities including Soldier in the Loop Accuracy testing, award first production option for the handguns and ammunition to support completion of Initial Operational Test and Evaluation (IOT&E). Will complete Energetic Material Qualification (EMQ) testing, and conduct Log Demo two (2). Will conduct First Article Test (FAT) for both the full size and compact versions of the MHS. Will conduct activities required to support Conditional Materiel Release, Type Classification – Limited Production, and Full Materiel Release.</p>				

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S63 / <i>Individual Weapons Engineering Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Squad Designated Marksman Rifle (SDM): Will continue to inform requirements and the Doctrine, Organization, Training, Materiel, Leadership & Education, Personnel, and Facilities (DOTMLPF) analysis. Will continue to develop Acquisition Strategy and initiate execution.</p> <p>FY2018 New Start - The Interim Combat Service Rifle (ICSR) will be a lightweight derivative of a 7.62mm caliber rifle for selected Brigade Combat Teams (BCT) pending development, procurement and fielding of a new Next Generation Squad Weapon (NGSW). BCTs require the capability to engage threat personnel with aimed lethal and accurate fires at ranges exceeding the current 5.56mm Carbine provided today. Threats are now typically engaging US Forces at ranges between 300m - 600m. US Forces require this interim capability to regain parity and limited overmatch while the longer term overmatch capability is under development.</p> <p>New Weapon Evaluations and Assessments: Will continue to provide initial evaluation and assessment of new weapons.</p>				
<p>Title: Small Arms Weapons Enhancements</p> <p>Description: Description: Enhancements and developments of small arms weapons</p> <p>FY 2016 Accomplishments: Compact Semi-Automatic Sniper System (CSASS): Awarded a single contract for thirty (30) Non Developmental Items (NDI) weapon systems. Conducted verification and validation Production Qualification Testing (PQT). Conducted a depot assessment and plan, coordinate, resource and conduct Pre-Logistics Demonstration events. Developed a fielding plan. Continued to fund the IPT and initiate preparation of Type Classification and MS-C/TC STD decision documentation. Transitioned within the same Program Element to EW4 in FY2017.</p> <p>Intelligent Rail (Formerly known as Powered Rail): Continued further integration with weapon platform and soldier borne power and data management systems as well as integrating enablers to the weapon platform. Continued supporting efforts related to Ballistic Compensation Over Rail, Polymer Optic Integration, and development of a General Purpose Transceiver to support the integration of various data applications, including network communications. Acquired developmental systems to prepare for and conducted developmental testing and Soldier evaluations.</p> <p>Small Business Innovation Research (SBIR) Enhancements: Continue to support Phase II Enhancement and/or initialization of Phase III SBIR activities.</p>		3.056	0.250	0.100

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S63 / <i>Individual Weapons Engineering Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<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: FY17 New Start Additive Manufacturing 3D Printing: Continue to use additive manufacturing (3D Printing) methods to fabricate and test selected prototype weapons components for all weapons.</p> <p>Intelligent Rail (Formerly known as Powered Rail): Continue supporting efforts related to Ballistic Compensation Over Rail, Polymer Optic Integration, and development of a General Purpose Transceiver to support the integration of various data applications including network communications. Will support acquired developmental systems to conduct developmental testing and Soldier evaluations.</p> <p>Small Business Innovation Research (SBIR) Enhancements: Continue to support Phase II Enhancement and/or initialization of Phase III SBIR activities.</p> <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: Intelligent Rail (Formerly known as Powered Rail): Will continue further integration with weapon platform and soldier borne power and data management systems as well as integrating enablers to the weapon platform. Continued supporting efforts related to Ballistic Compensation Over Rail, Polymer Optic Integration, and development of a General Purpose Transceiver to support the integration of various data applications, including network communications. Acquired developmental systems to prepare for and conducted developmental testing and Soldier evaluations.</p> <p>Small Business Innovation Research (SBIR) Enhancements: Will continue to support Phase II Enhancement and/or initialization of Phase III SBIR activities.</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: Description: Improvement of small arms ammunition</p> <p>FY 2016 Accomplishments:</p>		1.618	0.250	0.050

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S63 / <i>Individual Weapons Engineering Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>XM1112 Airburst Non-Lethal Munitions (ANLM): Completed Milestone C package and conducted reliability retest. Transitioned within the same Program Element to EW4 in FY2017.</p> <p>XM1116 12 Gauge Non-Lethal Extended Range: Received approval of the Acquisition Decision Memorandum to allow entry into the production & deployment phase of the Acquisition Lifecycle and Type Classification. User assessment to address the offset aim point issue found when firing the round out of the M26 Modular Shotgun was conducted at ARDEC utilizing the M68 Close Combat Optic instead of the rear sight adapter. ATEC provided final approved version of supportability memo that modifies the current Operational Assessment Report (OAR) to include using the M26 in the standalone configuration with the M68 CCO Optic when firing the round. This program has completed all tasks and has officially transitioned to PMCCS. No further reporting will be provided. This program was transitioned to PM Closed Combat System (CCS) under Program Executive Office (PEO) Ammunition.</p> <p>Ammunition Upgrades: Continued to evaluate the effect of new ammunition on small arms weapons.</p> <p>FY 2017 Plans: Ammunition Upgrades: Continue to evaluate the effect of new ammunition on small arms weapons.</p> <p>FY 2018 Plans: Ammunition Upgrades: Will continue to evaluate the effect of new ammunition on small arms weapons.</p>				
<p>Title: Combat Optics</p> <p>Description: Description: Improvement of combat optics</p> <p>FY 2016 Accomplishments: Grenadier Sighting System (GSS): Completed Source Selection evaluations and award developmental contract for the GSS, test and evaluation efforts, system engineering analysis, and reviews. Following award of the developmental contract the government conducted a user experiment, system requirements review, and preliminary design review. Further developed test plans and plans for fielding, new equipment training, and development of a deployment logistics package.</p> <p>Mounted Machine Gun Optic: Finalized Machine Gun Optic Capability Production Document (CPD), including anticipated final JROC approval. Conducted final pre-Milestone C activities in preparation for transition to Program of Record in FY2017; emphasis on development of Test & Evaluation Master Plan (TEMP) and Production Readiness Review (PRR). Developed Acquisition Strategy and initial package for Milestone C, Type Classification and Materiel Release. Prepared Milestone Decision Document for program of record. Transitioned within the same Program Element to EW4 in FY2017.</p>		6.720	0.250	0.100

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S63 / <i>Individual Weapons Engineering Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Optics Upgrades: Continued engineering evaluations, verification and validation of weapon optics performance requirements.</p> <p>FY 2017 Plans: Grenadier Sighting System (GSS): Continue with the 2-vendor Research and Development effort and the government will conduct a second user engagement, a critical design review, and further technical testing. Initiate Source Selection evaluation for possible down select going into Phase II activities. Further refine test plan, plans for fielding, new equipment training, and the deployment logistics package.</p> <p>Optics Upgrades: Continue engineering evaluations, verification and validation of weapon optics performance requirements.</p> <p>FY 2018 Plans: Grenadier Sighting System (GSS): Will finalize the Research and Development effort.</p> <p>Optics Upgrades: Will continue to perform engineering evaluations, verification and validation of weapon optics performance requirements.</p>				
<p>Title: Fire Control</p> <p>Description: Description: Improvement of small arms fire control</p> <p>FY 2016 Accomplishments: Advanced Fire Control with Precision Projectile/Dynamic Target Tracking: Supported integration Small Arms Fire Control - Squad: Continued to inform requirements for Squad weapons in the Small Arms Fire Control Capability Development Document (CDD). Small Arms Fire Control - Precision: The Ballistically Optimized Sniper Scope (BOSS) , a Precision Fire Control prototype was demonstrated to USASFC, USASS, and USMC users where it received favorable feedback. The BOSS was tested against US Army ruggedization and E3 requirements, and assessed optical parameters to inform requirements and design limitations. Optical magnification study was conducted , Performance Specification was initiated to define CDD operational requirements to material solution parameters. In addition, the BOSS was demonstrated to numerous PEO VIPs and MCOE VIP. The BOSS was designated the XM157, Fire Control System, Sniper. Transitioned within the same Program Element to EW4 in FY2017. Small Arms Fire Control Upgrades: Continued to test, evaluate and analyze ongoing and new activities to enhance small arms weapons fire control.</p> <p>FY 2017 Plans:</p>		0.908	1.926	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S63 / <i>Individual Weapons Engineering Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Small Arms Fire Control - Squad: Finalize Fire Control Capability Development Document (CDD), Squad requirements, including anticipated final Joint Requirements Oversight Council (JROC) approval. Will initiate contracting effort to support pre-Milestone B activities, including Acquisition Strategy and System Engineering Plan (SEP), in preparation for transition to Program of Record.			
Fire Control Upgrades: Continue to test, evaluate and analyze ongoing and new activities to enhance small arms weapons fire control.			
Title: Research and Analysis	0.100	0.100	0.050
Description: Market Research and Cost Benefit Analysis			
FY 2016 Accomplishments: Continued Market Research and Cost Benefit Analysis of new small arms weapon and/or enhancements for engineering and manufacturing development. Conducted some preliminary research and analysis for the Sub-Compact effort.			
FY 2017 Plans: Continue Market Research and Cost Benefit Analysis of new small arms weapon and/or enhancements for engineering and manufacturing development.			
FY 2018 Plans: Will continue Market Research and Cost Benefit Analysis of new small arms weapon and/or enhancements for engineering and manufacturing development.			
Accomplishments/Planned Programs Subtotals	22.377	11.801	6.961

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>
• Small Arms Improvement: <i>RDTE S54, Program Element</i> <i>0603827A - Soldier Systems</i> <i>- Advanced Development</i>	7.153	10.554	6.851	-	6.851	10.377	9.312	15.421	19.595	Continuing	Continuing
• CSASS: <i>WTCV, G01507, Compact</i> <i>Semi-Automatic Sniper Systems</i>	-	0.992	-	-	-	8.310	41.360	41.360	15.050	Continuing	Continuing
• M4A1 Carbine: <i>WTCV,</i> <i>G13503, M4A1 Carbine</i>	31.260	40.493	43.150	-	43.150	31.619	31.538	15.731	13.417	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S63 / <i>Individual Weapons Engineering 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>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>
• M4 Carbine MODS: <i>WTCV, GB3007, M4 Carbine MODS</i>	27.566	29.752	31.315	-	31.315	32.551	18.524	11.728	11.618	Continuing	Continuing
• XM320 GLM: <i>WTCV, G01501, XM320 GLM</i>	13.516	3.062	4.524	-	4.524	-	-	8.000	16.000	Continuing	Continuing
• Handgun: <i>WTCV, G15325, Handgun</i>	-	2.500	8.326	-	8.326	19.572	22.884	-	-	Continuing	Continuing
• Items Less Than \$5.0M: <i>WTCV, GL32000, Items Less Than \$5M</i>	3.408	2.331	5.075	-	5.075	1.235	1.697	2.978	3.000	Continuing	Continuing
• Modifications Less Than \$5.0M: <i>WTCV, GC09250, Modifications Less Than \$5M</i>	3.737	3.157	2.219	-	2.219	5.968	5.482	3.771	3.548	Continuing	Continuing
• Soldier Enhancement Program: <i>RDTE S58, Program Element 0654601 - Soldier Enhancement Program</i>	15.334	6.776	3.353	-	3.353	3.257	3.322	3.389	3.414	Continuing	Continuing

Remarks

In support of Small Arms Requirements, components or prototypes developed in Small Arms Improvement, Project S54, Program Element 0603827A, (Budget Activity 4) is transitioned to Small Arms Improvement, Project S63, Program Element 0604601A, (Budget Activity 5) to conduct engineering and manufacturing development. Once the component, prototype or operational prototype achieves Milestone C and type classification the item transitions to small arms weapon production or modification program.

D. Acquisition Strategy

Primary strategy is to mature and finalize design efforts, award Research, Development, Test and Evaluation (RDT&E) hardware contracts, and test and evaluate systems that result in type classification and follow-on production contract awards.

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 / 5					R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>				Project (Number/Name) S64 / <i>Common Remotely Operated Wpn Sys (CROWS)</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
S64: <i>Common Remotely Operated Wpn Sys (CROWS)</i>	-	3.952	4.331	22.500	-	22.500	9.300	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In support of an Army directed requirement (reference DAPR-ZA Memorandum, date 5 July 2016) to provide an increased lethality modification to the Joint Light Tactical Vehicle (JLTV), to serve as the Infantry Brigade Combat Team (IBCT) light reconnaissance vehicle, an upgraded remote weapon station will be developed that integrates a medium-caliber weapon system. Development will also begin on integration of additional effectors, such as the Stinger surface-to-air missile, to increase system lethality against ground and aerial targets.

Beginning in FY2018, \$22.500 million will purchase prototypes of an improved and modified remotely operated weapon station for system and component level development, testing and qualification, to include mechanical and software integration with a 30mm autocannon and integration of Stinger surface-to-air missile.

The Maneuver Support Center of Excellence (MSCoE) at FT Leonard Wood, MO (user community) has identified continued development of the Common Remotely Operated Weapon Station (CROWS) as a critical improvement for the Soldier in a combat environment. By addressing the capability gap of non-turreted, lightly armored vehicles where the gunner is exposed to enemy fire, the current CROWS system provides the ability to rapidly and accurately locate and engage the enemy while allowing platform gunners to remain under armor, thereby providing greater protection and increasing overall lethality.

Next generation requirements for the CROWS are identified in the CROWS Increment II Capability Development Document (CDD). CROWS Increment II capability improvements will bolster overall situational awareness, survivability and lethality. Increment II requirements include improved sensor systems for enhanced identification ranges; wider fields of view; improved on-the-move accuracy; training capability; battlefield obscurants; mission data recording for After Action Reviews (AAR); increased lethality using legacy and future anti-personnel and anti-materiel precision scalable lethal and non-lethal weapon systems; improved ballistics protection; adaptability to integrate on a variety of legacy and future platforms including ground vehicles, watercraft, semi-autonomous and autonomous platforms; precision targeting including visible and infrared (IR) pointers; target hand-off; slew-to-cue; escalation of force (EOF) capabilities; and other additional system modifications and improvements.

Obsolescence and Increment II requirements will address recommendations identified in the Operational Test Agency Milestone Assessment Report (OMAR) and user community feedback. These modifications include, but are not limited to: improved optics survivability; auto-zoom; improved auto-tracking; improved sensors for increased situational awareness; and improved rounds counter. Additionally, development efforts will include system and component level reliability improvements that will extend system life and reduce overall CROWS logistics footprint.

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

	FY 2016	FY 2017	FY 2018
Title: Medium Caliber Remote Weapon Station (RWS) Development	-	-	16.875

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S64 / <i>Common Remotely Operated Wpn Sys (CROWS)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>FY 2018 Plans: Will purchase prototypes and design improvements for a remote weapon station that integrates a medium-caliber weapon system. Contract efforts will culminate in delivery of prototypes of a modified remote weapon station for qualification testing in the following year.</p> <p>Title: Technology Refresh and Obsolescence</p> <p>Description: Description: Technology Refresh and Obsolescence</p> <p>FY 2016 Accomplishments: Contractor initiated the design and fabrication of an improved Thermal Imaging Module (TIM) with a smaller pixel pitch and higher pixel density focal plane array, and enhanced video processing capability allowing the module to provide a wider field of view for increased situational awareness.</p> <p>FY 2017 Plans: Contractor continues the development of system enhancements addressing obsolescence issues, user community feedback, OMAR recommendations, reliability improvements and increased situational awareness and targeting capability.</p>		1.569	0.920	-
<p>Title: Engineering Support</p> <p>Description: Description: Government Engineering Support.</p> <p>FY 2016 Accomplishments: Provided engineering support and oversight of design improvements and contractor performance; development of enhanced sensors, infrared sights, video capabilities and situational awareness. Developed training and technical publications associated with the system improvements.</p> <p>FY 2017 Plans: Continue to provide engineering support and oversight of design improvements and contractor performance of Technology Refresh efforts and enhanced sensor development. Begin requirements distillation, performance tradeoffs, feasibility studies and analysis of alternatives for system enhancements supporting Increment II requirements, user feedback, and reliability improvements.</p> <p>FY 2018 Plans: Will provide engineering support and oversight of the development of an improved remote weapon station that integrates a medium-caliber weapon system and an integration kit for additional effectors, such as the Stinger surface-to-air missile.</p>		1.009	1.656	3.500
<p>Title: Test and Evaluation</p>		0.195	0.651	0.625

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S64 / <i>Common Remotely Operated Wpn Sys (CROWS)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Description: Description: Test and Evaluation</p> <p>FY 2016 Accomplishments: Conducted the initial developmental testing and evaluation of improvements and develop testing and evaluation criteria and documentation for the Thermal Imaging Module.</p> <p>FY 2017 Plans: Continue developmental testing and evaluation of system enhancements addressing obsolescence issues, user community feedback and reliability improvements. Begin testing sensor enhancements improving situational awareness and targeting capability. Develop test and evaluation criteria and documentation for the system enhancements supporting Increment II requirements, user feedback and reliability improvements.</p> <p>FY 2018 Plans: Will begin planning and documentation for government testing and evaluation of prototype remote weapon stations that integrate a medium-caliber weapon system and an integration kit for additional effectors, such as the Stinger surface-to-air missile.</p>				
<p>Title: Program Management</p> <p>Description: Description: Program Management.</p> <p>FY 2016 Accomplishments: Provided oversight of product design and development, to include engineering support, contract actions and test activities throughout the fiscal year. Program management office facilitated test events at various government laboratories to test prototype units of the improved fire control unit processor and system slip ring, in order to quantify performance with the most current sensors and effectors, and managing the life cycle of the program to include future acquisition and sustainment plans.</p> <p>FY 2017 Plans: Provide oversight of product design and development, to include engineering support, contract actions and test activities throughout the fiscal year. Additionally, provide program oversight of the system enhancements supporting Increment II requirements. Program management office facilitate test events at various government laboratories to test prototype components, sub-system and systems. Continue to manage the life cycle of the program to include future acquisition and sustainment plans.</p> <p>FY 2018 Plans: Will provide program management oversight of development, testing and evaluation of an improved remote weapon station that integrates a medium-caliber weapon system and an integration kit for additional effectors, such as the Stinger surface-to-air missile.</p>		1.179	1.104	1.500
Accomplishments/Planned Programs Subtotals		3.952	4.331	22.500

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S64 / <i>Common Remotely Operated Wpn Sys (CROWS)</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>
• CROWS (G04700, W&TCV): <i>W&TCV, G04700, CROWS</i>	40.500	25.164	0.750	-	0.750	2.500	20.000	20.000	-	0.000	108.914
• LW 30MM CANNON (0604601F12, RDT&E): <i>RDT&E, 0604601F12, 30MM CANNON</i>	-	-	5.500	-	5.500	-	-	-	-	0	5.500
• GUN AUTOMATIC 30MM M230: <i>W&TCV, G13800, M230</i>	-	-	-	-	-	7.500	20.000	10.000	-	0	37.500

Remarks

D. Acquisition Strategy

The modified medium-caliber remote weapon station that will begin development in FY2018 shall use an incremental acquisition approach in its strategy. The first increment will be part of an Urgent Materiel Release and will modify the legacy M153 Common Remotely Operated Weapon Station (CROWS) in order to integrate the XM914 30mm autocannon. The second increment will require further design and development changes, upgrade the optics on the remote weapon station in order to increase the target identification range of the station to match the capability of the weapon, and incorporate a coaxial machine gun as a secondary weapon system.

The integration of additional effectors, such as the Stinger surface-to-air missile system, will leverage prior efforts to integrate the Javelin missile on the remote weapon station.

The legacy Common Remotely Operated Weapon Station (CROWS) used a single-step acquisition approach in its strategy. The CROWS achieved Type Classification Standard in 3QFY2011, Full Materiel Release in 3QFY2012 and Full Rate Production in 4QFY2012, in accordance with the Capability Production Document (CPD) Increment I, as clarified in June 2009. Capability Development Document Increment II was approved in October 2015 addressing requirements for the next generation of CROWS.

The program objective is to continue developing, improving and fielding the current generation (Increment I) and next generation (Increment II) of CROWS on various platforms in accordance with the Basis of Issue Plan (BOIP). The program supports new and emerging urgent requirements like the integration of the Mine Resistant Ambush Protected (MRAP) family of vehicles, ground combat systems, Joint Lightweight Tactical Vehicles (JLTV) and fixed site mounting systems to support Integrated Base Defense (IBD).

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 / 5				PE 0604601A / Infantry Support Weapons				S64 / Common Remotely Operated Wpn Sys (CROWS)							
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	MIPR	PM Soldier Weapons : Picatinny Arsenal, NJ	0.462	1.179	Feb 2016	1.104	Feb 2017	1.500	Feb 2018	-		1.500	Continuing	Continuing	0.000
Subtotal			0.462	1.179		1.104		1.500		-		1.500	-	-	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
Technology Refresh, Obsolescence and Increment II Enhancements	C/FFP	Kongsberg Protech Systems USA : Johnstown, PA	9.145	1.569	Sep 2016	0.920	Jun 2017	-		-		-	Continuing	Continuing	0.000
Medium Caliber RWS Development	C/FFP	TBD : TBD	0.000	-		-		16.875	Mar 2018	-		16.875	Continuing	Continuing	0.000
Subtotal			9.145	1.569		0.920		16.875		-		16.875	-	-	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 Support	MIPR	ARDEC : Picatinny Arsenal, NJ	0.748	1.009	Feb 2016	1.656	Feb 2017	3.500	Feb 2018	-		3.500	Continuing	Continuing	0.000
Subtotal			0.748	1.009		1.656		3.500		-		3.500	-	-	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 and Execution	Various	Various : Multiple	0.127	0.195	Feb 2016	0.651	Feb 2017	0.625	Feb 2018	-		0.625	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 2040 / 5					R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>				Project (Number/Name) S64 / <i>Common Remotely Operated Wpn Sys (CROWS)</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
Subtotal			0.127	0.195		0.651		0.625		-		0.625	-	-	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			10.482	3.952		4.331		22.500		-		22.500	-	-	0.000

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S64 / <i>Common Remotely Operated Wpn Sys (CROWS)</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
Contractor Design and Fabrication																												
Engineering Support (Government)																												
Development Test & Evaluation																												
Program Management																												
Increment II Product Improvement																												
Medium Caliber Remote Weapon Station Development																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S64 / <i>Common Remotely Operated Wpn Sys (CROWS)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Contractor Design and Fabrication	1	2016	4	2017
Engineering Support (Government)	3	2015	4	2019
Development Test & Evaluation	3	2015	4	2019
Program Management	3	2015	4	2019
Increment II Product Improvement	2	2017	4	2017
Medium Caliber Remote Weapon Station Development	1	2018	4	2019

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>				Project (Number/Name) S70 / <i>Personnel Recovery Support System (PRSS)</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>S70: Personnel Recovery Support System (PRSS)</i>	-	1.208	1.121	1.330	-	1.330	1.149	1.176	0.651	0.650	0.000	7.285
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

This project provides the continued maturation of PRSS products that enable operations to report and locate isolated, missing, detained or captured Soldiers. The PRSS program consists of the enhancement of existing products to ensure continued successful interoperability within the relevant theater of operations and the Continental United States (CONUS), and the demonstration and testing of a production representative encrypted Personnel Recovery Device (PRD) that operates over a secure architecture.

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

	FY 2016	FY 2017	FY 2018
Title: Development of Personnel Recovery Support System (PRSS)	1.208	1.121	1.330
Description: Integration, evaluation, testing and qualification of PRSS products to ensure continued successful interoperability within the relevant theater of operation, and development of a PRD that operates over a secure architecture.			
FY 2016 Accomplishments: Conducted OCONUS Over-The-Air test of the secure waveform for the PRD using functioning PRD prototype.			
FY 2017 Plans: Perform end-to-end testing to exercise all aspects of the PRSS communications system worldwide. Develop and test enhancements to personnel recovery equipment for improved operational capability.			
FY 2018 Plans: Conduct a Limited User Test, and an Operational Test of PRDs in support of a full rate production decision.			
Accomplishments/Planned Programs Subtotals	1.208	1.121	1.330

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) S70 / <i>Personnel Recovery Support System (PRSS)</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>
• Personnel Recovery Support Sys OPA: <i>Other Procurement, Army, G01101-Personnel Recovery Support System (PRSS)</i>	7.733	10.856	5.390	-	5.390	6.630	5.518	5.957	6.099	Continuing	Continuing

Remarks

D. Acquisition Strategy

Execute PRSS program development effort for performance optimization through contracts with industry and Military Interdepartmental Purchase Requests to other Governmental agencies. Perform continuing development and test of new waveforms and hardware to ensure successful interoperability for personnel recovery, and to mitigate potential security compromises to the PRSS system.

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 / 5					R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>				Project (Number/Name) VS5 / <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
<i>VS5: Soldier Protective Equipment</i>	-	14.659	2.141	1.758	-	1.758	6.122	6.856	8.582	9.943	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding supports engineering and manufacturing development and full rate production decision reviews of Soldier Protective Equipment. It leverages advancements in technology to continue improvements to hard and soft body armor components, helmets and other personal protective equipment.

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

	FY 2016	FY 2017	FY 2018
Title: Soldier Protective Equipment	14.659	2.141	1.758
Description: Funding line established in FY12. Effort was previously executed in Program Element 0604601 S60. The objective of this 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 system level development and integration of SPS subsystems and components transitioned from VS4 Advanced Component Development and Prototypes (ACD&P). Conducted system-level Initial Operating Test (IOT)/Live Fire testing of SPS VTP/TEP subsystems to support Full-Rate Production (FRP) decisions. Conducted IHPS DT III (ballistic, non-ballistic & human factors testing). Conducted Milestone C decision reviews for the IHPS / TCEP subsystems. Completed LRIP FAT testing for the VTP/TEP systems. Continued efforts to characterize and increase durability and functional service life of all PPE.			
FY 2017 Plans: Continued system level development and integration of SPS subsystems and components transitioned from VS4 Advanced Component Development and Prototypes (ACD&P). Continuation of Live Fire testing of the Soldier Protection System (SPS) Vital Torso Protection (VTP) subsystem to support Full-Rate Production (FRP) decisions. Conducted Torso and Extremity Protection (TEP) Fit & Sizing / Human Factors Evaluation (HFE) 2 Integration / Cold & Tropical regions testing. Conduct IHPS First Article Test (FAT), Blast, Ground Limited User Test (LUT), and Live Fire Test HFEs for improved personal protective equipment and a follow-on Full Up System Level test. Continued efforts to characterize and increase durability and functional service life of all PPE.			
FY 2018 Plans: Conduct FAT and System Level Testing for the VTP systems. Prepare for the Full Rate Production (FRP) decisions for VTP / IHPS by preparing the Army Evaluation Command (AEC) / Director of Operational Test and Evaluation (DOTE) Live fire Test reports.. Continue to evaluate and develop system and subsystem technologies across the PPE portfolio (extremities, torso and vital torso, head, eye and face protection) from emerging ballistic/blast threats. Continue to test ballistic properties of current PPE after exposure to extreme storage conditions for better shelf and service life predictions. Continue development of materials and			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604601A / <i>Infantry Support Weapons</i>	Project (Number/Name) VS5 / <i>Soldier Protective Equipment</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
technologies to reduce SPS weight and bulk at the system, subsystem and component level and continue efforts to characterize and increase durability and functional service life. Complete the testing (cold weather, durability, etc.) and qualification of the Transition Combat Eye Protection (TCEP) to allow its inclusion on the Authorized Protective Eyewear List (APEL).			
Accomplishments/Planned Programs Subtotals	14.659	2.141	1.758

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
• VS4 6.4 RDTE: <i>RDTE, 0603827A.VS4, Soldier Protective Equipment</i>	5.194	16.294	10.281	-	10.281	8.224	2.869	4.496	4.967	0.000	52.325
• OMA: <i>OMA, 121017, Central Funding & Fielding</i>	30.000	93.330	74.486	-	74.486	78.550	78.794	78.540	78.578	0.000	512.278

Remarks

D. Acquisition Strategy

Acquisition strategies for these programs vary in methods, and range from: 1) Material Change programs that result in engineering changes to existing systems to; 2) Traditional development programs that include an Engineering and Manufacturing Development phase ranging in duration from 12 to 48 months, depending on the level of complexity and testing required.

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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604604A / <i>Medium Tactical Vehicles</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	6.039	-	6.039	3.744	2.177	3.364	3.400	Continuing	Continuing
H07: <i>Family Of Med Tac Veh</i>	-	0.000	0.000	6.039	-	6.039	3.744	2.177	3.364	3.400	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element (PE) supports continued modernization of the Army's medium truck and trailer fleet and the Armored Security Vehicle (ASV).

The Family of Medium Tactical Vehicles (FMTV) fills 2 1/2-ton Light Medium Tactical Vehicle (LMTV) and 5-ton Medium Tactical Vehicle (MTV) truck requirements and associated companion trailers. FMTV trucks perform over 55 percent of the Army's local haul, line haul, and unit resupply missions. It operates throughout theater as multi-purpose transportation vehicles in combat, combat support, and combat service support units.

The ASV is an all-wheel drive armored vehicle that provides ballistic protection, overhead protection, and protection against landmines. It is used by the Military Police to perform missions of area security, maneuver, and mobility support.

Funding from this Program Element will be used to support the continued evolution of the future FMTV fleet as well as tech insertion opportunities to keep the current FMTV fleet relevant on today's battlefield. This includes upgrades in survivability and crew protection, improved safety by leveraging advancements in commercial active safety technologies, modernizing the aging Low Velocity Air Drop (LVAD) fleet of vehicles, improved utilization through modularity, integration of advanced high efficiency powertrains and fuel saving technologies, and insertion of autonomous vehicle capabilities that will change the way transportation missions are conducted around the world.

FY 2018 Project H07 Base funds in the amount of \$6.039 million will be used for the procurement of FMTVA2 Live Fire Test assets, development and testing of the FMTVA1P2 Underbody Armor Kit, analysis to support configuration options for the next generation LVAD model, development and integration of active safety improvements, and Analysis of Alternative engine and Material Handling Equipment (MHE) options to address future obsolescence issues.

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604604A / <i>Medium Tactical Vehicles</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	6.039	-	6.039
Total Adjustments	0.000	0.000	6.039	-	6.039
• 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	6.039	-	6.039

Change Summary Explanation

FY 2018 Project H07 Base funds in the amount of \$6.039 million will be used for the procurement of FMTVA2 Live Fire Test assets, development and testing of the FMTVA1P2 Underbody Armor Kit, analysis to support configuration options for the next generation LVAD model, development and integration of active safety improvements, and Analysis of Alternative engine and Material Handling Equipment (MHE) options to address future obsolescence issues.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604604A / <i>Medium Tactical Vehicles</i>				Project (Number/Name) H07 / <i>Family Of Med Tac Veh</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
H07: <i>Family Of Med Tac Veh</i>	-	0.000	0.000	6.039	-	6.039	3.744	2.177	3.364	3.400	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The FMTVA2 production and Engineering Change Proposal (ECP) modernization effort restores vehicle performance that was lost due to the addition of armor protection kits as the threat to tactical vehicles and the FMTV has increased. The FMTVA2 also addresses Space, Weight, Power, and Cooling (SWaP-C) constraints from having to host an increasing amount of Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) and Counter-Incendiary Explosive Device (IED) equipment. Program Management Office (PMO) Medium Tactical Vehicles (MTV) is executing the FMTVA2 effort documented in a signed Acquisition Decision Memorandum (ADM) by the Army Acquisition Executive (AAE) on 16 November 2015. FY 2018 Project H07 Base funds in the amount of \$1.900 million will be used for the procurement of FMTVA2 Live Fire Test assets to support Live Fire Testing required per Chapter 139, Title 10 USC.

The FMTVA1P2 represents the FMTV model currently in production with over 38,000 vehicles fielded to date. The FMTVA1P2 will remain in the tactical vehicle fleet until 2040 and beyond. To keep the A1P2 fleet viable into the future and able to perform its mission in austere environments, upgrades to Survivability and Crew Protection Kits will be required as the threat on the battlefield evolves. FY 2018 Project H07 Base funds in the amount of \$1.800 million will be used for development and testing of improvements to the FMTVA1P2 Underbody Armor Kit that simplifies the design and reduces installation cost and complexity.

The three FMTV LVAD models (M1081, M1093, M1094) ended production in 2009 and represent the oldest vehicles in the FMTV fleet. Updates to the LVAD are needed to address obsolescence issues and bring the configuration up to today's standards. FY 2018 Project H07 Base funds in the amount of \$0.500 million will be used for analysis to support configuration options for the next generation LVAD model.

Improved vehicle safety technologies are now available commercially that can reduce the number and severity of motor vehicle accidents, including Electronic Stability Control, collision mitigation, lane keeping assist, and rollover prevention. FY 2018 Project H07 Base funds in the amount of \$1.339 million will be used for development and integration of active safety improvements.

To ensure supportability of the FMTVA1P2 through 2040 and beyond, the PMO MTV, as lifecycle managers for the system, shall address potential obsolescence issues with the powertrain and Material Handling Equipment used on the FMTV. FY 2018 Project H07 Base funds in the amount of \$0.450 million will be used for Analysis of Alternative engine and MHE options to address future obsolescence issues.

FY 2018 Project H07 Base funds in the amount of \$0.050 million will be used for Systems Engineering/Program Management (SEPM) support.

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

	FY 2016	FY 2017	FY 2018
Title: Procurement of FMTVA2 Live Fire Test Assets	-	-	1.900
Description: Live Fire test assets are needed to support Live Fire Testing required per Chapter 139, Title 10 USC.			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604604A / <i>Medium Tactical Vehicles</i>	Project (Number/Name) H07 / <i>Family Of Med Tac Veh</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
FY 2018 Plans: Funding will be used to procure four M1078A2 vehicles for Live Fire testing.				
Title: FMTVA1P2 Underbody Armor Kit Improvement Description: Development and testing of improvements to the FMTVA1P2 Underbody Armor Kit that simplifies the design and reduces installation cost and complexity.		-	-	1.800
FY 2018 Plans: Funding will be used for development and testing.				
Title: Configuration Options Next Generation LVAD Model Description: Updates to the LVAD are needed to address obsolescence issues and bring the configuration up to today's standards.		-	-	0.500
FY 2018 Plans: Funding will be used for analysis to support configuration options for the next generation LVAD model.				
Title: Improved Vehicle Safety Technologies Description: Improved vehicle safety technologies are now available commercially that can reduce the number and severity of motor vehicle accidents		-	-	1.339
FY 2018 Plans: Funding will be used for development and integration of active safety improvements on the FMTVA1P2.				
Title: FMTV Obsolescence Concerns Description: Address potential obsolescence issues with the powertrain and Material Handling Equipment (MHE) used on the FMTV.		-	-	0.450
FY 2018 Plans: Funding will be used for Analysis of Alternative engine and MHE options to address future obsolescence issues.				
Title: Systems Engineering/Program Management Description: SEPM includes System Engineering and Program Management oversight required to manage the program and provide contractor oversight. Salaries, Benefits, Travel, Personnel Training and other Government costs are included for retaining a professional acquisition workforce.		-	-	0.050

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604604A / <i>Medium Tactical Vehicles</i>	Project (Number/Name) H07 / <i>Family Of Med Tac Veh</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<i>FY 2018 Plans:</i> Includes Program Management, Engineering and Budget support for FMTVA1P2 and FMTVA2.			
Accomplishments/Planned Programs Subtotals	-	-	6.039

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>
• OPA 1 D15500: <i>Family of Medium Tactical Vehicles D15500</i>	334.038	352.769	78.650	-	78.650	98.231	198.312	193.404	182.838	Continuing	Continuing

Remarks

D. Acquisition Strategy

Procurement of FMTVA2 Live Fire test assets: This is a separate line item on the FMTVA2 production contract.

FMTVA1P2 Underbody Armor Kit Improvement: This effort will utilize the existing System Technical Support contract with the current FMTV Original Equipment Manufacturer (OEM) as well as Government testing facilities.

Configuration options for the next generation LVAD model: This effort will utilize the System Technical Support contract with the FMTVA2 OEM.

Improved vehicle safety technologies: This effort will utilize development resources at the Tank Automotive Research, Development and Engineering Center (TARDEC) as well as Government and private integration and test facilities.

Address FMTV obsolescence concerns: This effort will utilize Government and private integration and test facilities.

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 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604611A / JAVELIN
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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	-	3.789	20.011	21.095	-	21.095	17.772	5.000	0.000	0.000	0.000	67.667
499: Javelin (AAWS-M)	-	3.789	20.011	21.095	-	21.095	17.772	5.000	0.000	0.000	0.000	67.667

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

Javelin is a man-portable, fire-and-forget, medium-range missile with enhanced situational awareness and precision direct-fire effects to defeat armored vehicles, fortifications, and soft targets in a range of military operations. Javelin uses a modular design to allow the system to evolve to meet changing threats and requirements via both software and hardware upgrades. The system consists of a reusable Command Launch Unit (CLU) with a built-in-test (BIT), and a modular missile encased in a disposable launch tube assembly. The system also includes training devices for tactical training and classroom training

FY 2018 Base dollars in the amount of \$21.095 million will continue development engineering of the Javelin Lightweight Command Launch Unit (CLU). Objective of the Javelin Lightweight CLU is a 50% reduction in weight and a 35% reduction in size compared to the Block I CLU, while meeting detect, recognize, and identify requirements. Javelin Lightweight CLU is a result of user feedback on weight and bulk, and addresses the Close Combat Missile System - Medium Capability Production Document objective system weight requirement.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	3.945	20.011	21.095	-	21.095
Current President's Budget	3.789	20.011	21.095	-	21.095
Total Adjustments	-0.156	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.156	-			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604611A / JAVELIN				Project (Number/Name) 499 / Javelin (AAWS-M)			
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
499: Javelin (AAWS-M)	-	3.789	20.011	21.095	-	21.095	17.772	5.000	0.000	0.000	0.000	67.667
Quantity of RDT&E Articles	-	-	7	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Javelin is a man-portable, fire-and-forget, medium-range missile with enhanced situational awareness and precision direct-fire effects to defeat armored vehicles, fortifications, and soft targets in a range of military operations. Javelin uses a modular design to allow the system to evolve to meet changing threats and requirements via both software and hardware upgrades. The system consists of a reusable Command Launch Unit (CLU) with a built-in-test (BIT), and a modular missile encased in a disposable launch tube assembly. The system also includes training devices for tactical training and classroom training

FY2018 Base dollars in the amount of \$21.095 million will continue development engineering of the Javelin Lightweight Command Launch Unit (CLU). Objective of the Javelin Lightweight CLU is a 50% reduction in weight and a 35% reduction in size compared to the Block I CLU, while meeting detect, recognize, and identify requirements. Javelin Lightweight CLU is a result of user feedback on weight and bulk, and addresses the Close Combat Missile System - Medium Capability Production Document objective system weight requirement.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Javelin System Improvements	3.789	20.011	21.095	-	21.095
Description: Develop Lightweight Command Launch Unit.					
FY 2016 Accomplishments: Lightweight CLU: completion of prototype hardware, firmware and software design. Critical prototype fabrication and system integration activities.					
FY 2017 Plans: Lightweight CLU Design phase - Conduct system level analysis; design, build and integrate 7 system-level prototypes for system-level design verification testing (DVT).					
FY 2018 Base Plans: Conduct DVT to include environmental, producibility, reliability, electromagnetic/electrostatic discharge, image quality, and mechanical separation/launch dynamic tests. Conduct user evaluation, critical design review, and prepare preliminary engineering change proposal.					
Accomplishments/Planned Programs Subtotals	3.789	20.011	21.095	-	21.095

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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 / 5	R-1 Program Element (Number/Name) PE 0604611A / JAVELIN	Project (Number/Name) 499 / Javelin (AAWS-M)
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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>
• SSN CC0007: <i>Javelin (AAWS-M) Procurement</i>	168.163	193.275	110.123	8.112	118.235	99.237	106.826	89.463	107.684	Continuing	Continuing
• SSN H06103: <i>Javelin Lightweight Command Launch Unit (CLU)</i>	-	-	-	-	-	-	-	30.000	45.000	Continuing	Continuing

Remarks

FY 2017-2020 procurement funds are to procure missiles only. No CLUs will be procured with these funds. Missiles, Lightweight CLUs, and associated training devices will be procured with FY 2021-2022 procurement funds.

D. Acquisition Strategy

Javelin Lightweight CLU development is Sole Source to the Javelin Joint Venture (Raytheon, Tucson, AZ, and Lockheed Martin, Orlando, FL). An Engineering Services Cost Plus contract with the Javelin Joint Venture will be utilized for Lightweight CLU development efforts. The major subassemblies, which are also the primary cost drivers, will be competed. The Javelin Joint Venture has invested Industry Research and Development in the Lightweight CLU. Development, prototype, and testing will occur FY 2015-2020 with production beginning in FY 2021. Army Acquisition Objective (AAO) is 4,500. Current plan is to field to priority Infantry Brigade Combat Teams and Special Forces and cascade Block 0 CLUs out of the inventory.

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 / 5	R-1 Program Element (Number/Name) PE 0604611A / JAVELIN	Project (Number/Name) 499 / Javelin (AAWS-M)
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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			
System Engineering/ Program Management, Govt	Allot	Close Combat Weapon Systems Project Office : Redstone Arsenal, AL	0.363	0.403	Nov 2015	1.767	Nov 2016	1.883	Oct 2017	-		1.883	2.117	6.533	0.000
Subtotal			0.363	0.403		1.767		1.883		-		1.883	2.117	6.533	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			
Lightweight CLU Development	SS/CPFF	JJV/Raytheon/ Lockheed Martin : Orlando, FL/ Tucson,AZ	2.345	2.642	Jan 2016	17.674	May 2017	12.954	Oct 2017	-		12.954	13.600	49.215	0.000
Lightweight CLU Development	MIPR	Redstone Test Center : Redstone Arsenal, AL	0.000	-		0.570	Nov 2016	-		-		-	0.000	0.570	0.000
Lightweight CLU Trade Studies and Demonstrations	MIPR	AMRDEC : Redstone Arsenal, AL	1.299	0.744	Nov 2015	-		-		-		-	0.000	2.043	0.000
Subtotal			3.644	3.386		18.244		12.954		-		12.954	13.600	51.828	0.000

Remarks
 JJV - Javelin Joint Venture
 SS CPFF - Sole Source Cost Plus Fixed Fee
 CLU - Command Launch Unit
 AMRDEC - Aviation & Missile Research, Development and Engineering Center
 MIPR - Military Interdepartmental Purchase Request

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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 / 5	R-1 Program Element (Number/Name) PE 0604611A / JAVELIN	Project (Number/Name) 499 / Javelin (AAWS-M)
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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			
Lightweight CLU Design Verification Testing	SS/CPFF	JJV/Raytheon/ Lockheed Martin : Orlando, FL/Tucson, AZ	0.000	-		-		0.722	Oct 2017	-		0.722	0.000	0.722	0.000
Lightweight CLU Design Verification Testing	MIPR	Redstone Test Center : Redstone Arsenal, AL	0.000	-		-		1.587	Oct 2017	-		1.587	0.000	1.587	0.000
Lightweight CLU Qualification Testing	SS/CPFF	JJV/Raytheon/ Lockheed Martin : Orlando, FL/Tucson, AZ	0.000	-		-		0.634	May 2018	-		0.634	0.991	1.625	0.000
Lightweight CLU Qualification Testing	MIPR	Redstone Test Center : Redstone Arsenal, AL	0.000	-		-		3.315	May 2018	-		3.315	6.064	9.379	0.000
Subtotal			0.000	-		-		6.258		-		6.258	7.055	13.313	0.000
Project Cost Totals			4.007	3.789		20.011		21.095		-		21.095	22.772	71.674	0.000

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604611A / JAVELIN	Project (Number/Name) 499 / Javelin (AAWS-M)
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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
Initiate LW CLU Prototype Software/Firmware																												
LW CLU Fabrication/ System Integration of Prototypes																												
LW CLU Prototype Demonstration																												
LW CLU Design / Build / Integrate DVT Units																												
LW CLU Design Verification Testing																												
LW CLU Design/Build/Integrate Qualification Units																												
LW CLU Qualification Testing																												

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604611A / JAVELIN	Project (Number/Name) 499 / Javelin (AAWS-M)
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Initiate LW CLU Prototype Software/Firmware	4	2015	3	2016
LW CLU Fabrication/ System Integration of Prototypes	4	2016	1	2017
LW CLU Prototype Demonstration	1	2017	1	2017
LW CLU Design / Build / Integrate DVT Units	3	2016	2	2018
LW CLU Design Verification Testing	2	2018	3	2018
LW CLU Design/Build/Integrate Qualification Units	3	2018	2	2019
LW CLU Qualification Testing	4	2018	3	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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604622A / <i>Family of Heavy Tactical Vehicles</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	11.429	10.507	-	10.507	20.602	12.924	17.495	4.209	Continuing	Continuing
659: <i>Family Of Hvy Tac Veh</i>	-	0.000	0.986	0.900	-	0.900	9.500	7.001	13.578	0.000	0.000	31.965
E50: <i>TRAILER DEVELOPMENT</i>	-	0.000	5.919	3.850	-	3.850	5.350	0.000	0.000	0.000	0.000	15.119
VR5: <i>TWV Protection Kits</i>	-	0.000	4.524	5.757	-	5.757	5.752	5.923	3.917	4.209	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element aligns system development and demonstration of Heavy Tactical Vehicles (HTV) with Future Force requirements to support combat and combat support missions. Missions include the following: line haul, local haul, and unit resupply. HTV trucks transport water, ammunition, and general cargo over all terrain and throughout the battle-space. Funding will also be used for developing the Army's next generation of tactical trucks, as part of the Army's Tactical Wheeled Vehicle Modernization Strategy. Funding in this Program Element (PE) supports the Family of Heavy Trucks to include active safety technologies, periodic evolutionary upgrade of survivability and crew protection as described in the Long Term Protection Strategy (LTPS), and heavy tactical trailer development.

FY 2018 Project 659 Base funds in the amount of \$0.900 million will be used to complete Enhanced Heavy Equipment Transporter (EHET) documentation and pre-Materiel Development Decision (pre-MDD) efforts, as well as, beginning pre-Milestone B efforts.

FY2018 Project E50 Base funds in the amount of \$3.850 million will be used to conduct Semi Trailer Low Bed (STLB) limited performance and reliability testing, Source Selection Evaluation Board (SSEB), and Systems Engineering Program Management (SEPM) support.

FY 2018 Project VR5 Base funds in the amount of \$5.757 million will be used to develop Heavy Dump Truck (HDT) armor; design, prototype and test axle, suspension and weapon station upgrades for the Heavy Expanded Mobility Tactical Truck A4 (HEMTTA4) and Palletized Load System A1 (PLSA1); convert the HEMTTA4/PLSA1 Underbody Armor Kit Technical Data Package (TDP) from Prototype-level to Production-level; and SEPM support.

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604622A / <i>Family of Heavy Tactical Vehicles</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	11.429	7.123	-	7.123
Current President's Budget	0.000	11.429	10.507	-	10.507
Total Adjustments	0.000	0.000	3.384	-	3.384
• 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	3.384	-	3.384

Change Summary Explanation

FY 2018 Project 659 Base funds in the amount of \$0.400 million will be used to complete Enhanced Heavy Equipment Transporter (EHET) documentation and pre-Materiel Development Decision (pre-MDD) efforts, as well as, beginning pre-Milestone B efforts.

FY2018 Project E50 Base funds in the amount of \$2.850 million will be used to conduct Semi Trailer Low Bed (STLB) limited performance and reliability testing, Source Selection Evaluation Board (SSEB), and Systems Engineering Program Management (SEPM) support.

FY 2018 Project VR5 Base funds in the amount of \$0.134 million will be used to develop Heavy Dump Truck (HDT) armor; design, prototype and test axle, suspension and weapon station upgrades for the Heavy Expanded Mobility Tactical Truck A4 (HEMTTA4) and Palletized Load System A1 (PLSA1); convert the HEMTTA4/PLSA1 Underbody Armor Kit Technical Data Package (TDP) from Prototype-level to Production-level; and SEPM support.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) 659 / Family Of Hvy Tac Veh
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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
659: Family Of Hvy Tac Veh	-	0.000	0.986	0.900	-	0.900	9.500	7.001	13.578	0.000	0.000	31.965
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
The EHETs program is expected to enter at Milestone B after completion of the AoA.

A. Mission Description and Budget Item Justification

The Heavy Equipment Transporter System (HETS) is comprised of the M1070A1 Tractor and M1000 Trailer and is used to transport, recover, and evacuate a combat loaded M1 Series main battle tank, an M88, or similar heavy loads that are permitted for use on roads in US and overseas. The Enhanced Heavy Equipment Transporter System (EHETS) shall be capable of safely transporting current and future models of the heaviest tracked vehicles located within an Armored Brigade Combat Team (ABCT) in combat configuration with all current and projected mission attachments and survivability upgrades installed, with an additional 10% to allow for mud and ice build-up, and future growth of combat systems. The EHETS tractor/trailer will be capable of transporting ABRAMS SEPv2/3 with road permits and required force protection.

FY2018 Project 659 Base funds in the amount of \$0.900 million will be used to complete Enhanced Heavy Equipment Transporter System (EHETS) documentation and beginning Milestone efforts in preparation for Engineering Manufacturing Development (EMD) Phase.

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

	FY 2016	FY 2017	FY 2018
<p>Title: EHETS System Engineer/Program Management Support (SEPM)</p> <p>Description: SEPM 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 professional acquisition workforce.</p> <p>FY 2017 Plans: Includes program management, engineering and budget support for EHET.</p> <p>FY 2018 Plans: Includes program management, engineering and budget support for EHET.</p>	-	0.725	0.650
<p>Title: EHETS Development</p> <p>Description: Perform Pre-Materiel Development Decision (Pre-MDD) Studies</p> <p>FY 2017 Plans:</p>	-	0.261	0.250

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) 659 / Family Of Hvy Tac Veh

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Perform Whole Systems Trade Analysis (WSTA) and Dynamic Object Oriented Requirements System (DOORS) studies.			
<i>FY 2018 Plans:</i> Engineering testing, technical reports, and analysis			
Accomplishments/Planned Programs Subtotals	-	0.986	0.900

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
• 010: Family of Heavy Tactical Vehicles (FHTV) DA0500	30.849	45.686	107.530	-	107.530	83.204	76.073	-	-	0	343.342

Remarks
The EHETs program is expected to enter at Milestone B after completion of the AoA.

D. Acquisition Strategy
Based on the outcome of the Analysis of Alternatives (AoA), the Enhanced Heavy Equipment Transporter System (EHETS) acquisition will be full and open competition. Planned efforts include: Requirements Analysis (FY17-19), Request for Proposal (FY20), Source Selection Evaluation Board (FY20-21), Runoff Contract Award (FY21), Engineering and Manufacturing Development (EMD) Start (FY21), Government testing (FY23-24), Production Contract Award (FY25), and First Unit Equipped (FY27).

E. Performance Metrics
The costs, schedule and technical (performance) requirements are reviewed and compared to the Acquisition Program Baseline (APB) on a regular basis. Meetings are held monthly to review and discuss status of each program. Schedules are monitored by the respective Integrated Product Team (IPT) to oversee and compare progress to APB timelines via an Integrated Master Schedule (IMS) for each program. All technical requirements are tested and confirmed prior to start of production. In addition, each program has the ability to perform added tests during production as required to assure technical requirements are being met. The product office also uses Project Recon to perform risk management. The tool is designed to capture, manage, and link Risks, Issues, and Opportunities in a centralized database to create an integrated model that covers the entire program lifecycle.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles				Project (Number/Name) E50 / TRAILER 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
E50: TRAILER DEVELOPMENT	-	0.000	5.919	3.850	-	3.850	5.350	0.000	0.000	0.000	0.000	15.119
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Semi Trailer Low Bed (STLB) is a 25-ton payload capacity semi-trailer with a fixed goose neck, step deck, and rear loading ramps. The STLB is interoperable with a variety of trucks residing across the U.S. Army equipment inventory. The STLB will be introduced into a theater of operations to transport construction equipment (CE) employed by U.S. Army Engineers to execute horizontal and vertical construction projects in support of U.S. Military or other national goals and objectives. The STLB is employed to transport CE, miscellaneous equipment, disabled equipment, Class IV (construction materials), and logistical provisions. The STLB supports units in the execution of the following tasks: expand the lodgment, construction/upgrade/rehabilitation and maintenance of main supply routes (MSR), alternate supply routes (ASR), logistical facilities, bituminous roads, helipads, airfields, landing strips, motor pools, parking areas, etc. These types of facilities are required for sustainment operations during decisive action operations. The STLB will also be used during routine exercises/deployments, disaster relief, and other nation building operations. The STLB will be capable of supporting mobility, counter mobility, survivability, counter improvised and sustainment needs and all applicable North Atlantic Treaty Organization (NATO) interoperability criteria. The current 25-ton semi-trailers were manufactured in the 1968 to 1975 timeframe with an average age of 42 to 49 years. The Economic Useful Life (EUL) of the current trailer is 30-years. The existing semi-trailers have far exceeded their EUL and are becoming increasingly difficult to support due to spare parts obsolescence, resulting in decreased readiness.

FY18 Base funds in the amount of \$3.850 million will be used to fund STLB limited performance and reliability testing, Source Selection Evaluation Board (SSEB), and Systems Engineering/Program Management (SEPM) support.

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

	FY 2016	FY 2017	FY 2018
Title: Bid Sample Testing	-	-	2.740
Description: Limited performance and reliability testing of trailers.			
FY 2018 Plans: This testing is a limited performance and reliability test of free bid sample trailers provided by potential offerors. The test results will be used in the Source Selection Evaluation Board (SSEB) to assist in the down-select.			
Title: Source Selection Evaluation Board (SSEB)	-	-	0.500
Description: Evaluate contractors for an Indefinite Delivery Indefinite Quantity (IDIQ) contract for prototype trailers.			
FY 2018 Plans: Conduct SSEB to award IDIQ contract to two contractors for prototype trailers for a run-off test.			
Title: Systems Engineering/Program Management (SEPM) Support	-	1.899	0.610

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) E50 / TRAILER DEVELOPMENT		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Description: SEPM includes PM and System Engineering oversight required to conduct requirements analysis, specification development, program management and contractor oversight. Salaries, Benefits, Travel, Personnel Training and other Government costs are included for retaining a professional acquisition workforce.</p> <p>FY 2017 Plans: Labor and travel support includes project management support for initiating project, systems engineering support for development of program documentation, budget/cost analyst support and travel costs to user rep locations to help understand and further define requirements.</p> <p>FY 2018 Plans: Includes program management, engineering and budget support for STLB.</p>				
<p>Title: Government Required Design and Development Efforts</p> <p>Description: Translate user requirements from Capability Production Document (CPD) to performance specifications.</p> <p>FY 2017 Plans: Whole Systems Trade Analysis (WSTA), Dynamic Object Oriented Requirements System (DOORS)</p>		-	0.900	-
<p>Title: Market Survey</p> <p>Description: Conduct market survey to determine availability of commercially built trailers to meet requirements.</p> <p>FY 2017 Plans: Conduct market survey to determine availability of commercially built trailers to meet requirements.</p>		-	0.222	-
<p>Title: Modification of Commercial Design by Original Equipment Manufacturer (OEM)</p> <p>Description: Systems engineering required to assess potential modifications to commercial trailer designs in order to meet military user requirements.</p> <p>FY 2017 Plans: Systems engineering required to assess potential modifications to commercial trailer designs in order to meet military user requirements.</p>		-	2.898	-
Accomplishments/Planned Programs Subtotals		-	5.919	3.850

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / <i>Family of Heavy Tactical Vehicles</i>	Project (Number/Name) E50 / <i>TRAILER 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>
• Family of Heavy Tactical Vehicles: <i>Family of Heavy Tactical Vehicles (FHTV) DA0500</i>	30.849	45.686	107.530	-	107.530	83.204	76.073	-	-	0.000	343.342
• Semitrailers, Flatbed: <i>Semitrailers, Flatbed D01001</i>	0.053	7.896	14.151	-	14.151	6.489	27.094	24.781	25.140	0	105.604

Remarks

D. Acquisition Strategy

The Semi Trailer Low Bed (STLB) will be a full and open competition including bid sample testing. The Source Selection Evaluation Board (SSEB) will evaluate the proposals as well as bid sample test results. Planned events include: Pre-Materiel Development Decision (pre-MDD) efforts (FY17-18), Requirements Analysis (FY17-18), Request for Proposal Development (FY19), SSEB (FY19-20), Bid Sample Test of Multiple Original Equipment Manufacturers (FY19-20), Contract Award (FY20), Production Verification Test (FY20-21), First Unit Equipped (FY22).

E. Performance Metrics

The costs, schedule and technical (performance) requirements are reviewed and compared to the Acquisition Program Baseline (APB) on a regular basis. Meetings are held monthly to review and discuss status of each program. Schedules are monitored by the respective Integrated Product Team (IPT) to oversee and compare progress to APB timelines via an Integrated Master Schedule (IMS) for each program. All technical requirements are tested and confirmed prior to start of production. In addition, each program has the ability to perform added tests during production as required to assure technical requirements are being met. The product office also uses Project Recon to perform risk management. The tool is designed to capture, manage, and link Risks, Issues, and Opportunities in a centralized database to create an integrated model that covers the entire program lifecycle.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles				Project (Number/Name) VR5 / TWV Protection Kits			
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
VR5: TWV Protection Kits	-	0.000	4.524	5.757	-	5.757	5.752	5.923	3.917	4.209	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program element supports periodic, evolutionary upgrade of survivability and crew protection for Heavy Tactical Vehicles (HTV) and Medium Tactical Vehicles (MTV) as described in the Tactical Wheeled Vehicle (TWV) Strategy and individual variants' Capability Production Documents. The upgrades will leverage the Army Technology Objective's (ATO) survivability and Army Research Laboratory's (ARL) research and development activities to develop and evaluate kits which increase the protection level of all HTVs to the Mine-Resistant Ambush Protected (MRAP) protection level as well as anticipating changing threat environments, protection gaps, or improving the operating performance, efficiency, and reliability through armor weight reduction. This Program Element (PE) also supports increasing crew protection by leveraging advancements in autonomous ground vehicle technology via development and evaluation of autonomous applique kits that can be applied to the current and future HTV fleet.

The Heavy Dump Truck (HDT) supports construction projects by loading, transporting and dumping payloads of sand and gravel aggregates, crushed rock, hot asphalt mixes, earth, clay, rubble, large boulders and other materials up to gross vehicle weight rating to job sites under world-wide climatic conditions. The HDT also serves as a quarry truck for the quick transport of bulk raw earth material to and from the crushing, screening and washing plant and the asphalt mixing plant. The HDT also serves as a transportation asset for organizational equipment. The HDT is Long Term Armor Strategy (LTAS) compliant with MRAP 1.1 underbody protection.

Heavy Expanded Mobility Tactical Truck A4 (HEMTTA4) and Palletized Load System A1 (PLSA1) Suspension and Weapon Station Upgrade - There have been several survivability enhancements that have occurred since the HEMTT and PLS truck production program began. These enhancements did not incorporate measures to correct for automotive performance degradation that has occurred due to the additional mass of the survivability enhancements. Currently the HEMTTA4 and PLSA1 with top, side, underbody, fuel tank and RPG protection as well as the addition of a weapon station have overloaded the truck axles by 10-15% or more. To regain the original design performance and safety factors, new suspension components are required.

HEMTTA4/PLSA1 Underbody Armor Kit Technical Data Package (TDP) Conversion from Prototype-level to Production-level - HEMTTA4/PLS A1 Underbody Kits provide an MRAP-level of underbody blast protection for the HEMTT Fleet and was developed in response to a Joint Urgent Operational Needs Statement (JUONS). The kit contains additional underbody armor, blast attenuating seats, and energy absorbent flooring; adding 2,550 lbs. to the vehicle. This underbody armor kit augments the existing top and side B-Kit armor. HEMTT and PLS share a common cab design, therefore, the Underbody Armor Kit can be applied to both trucks. The conversion effort is required to procure kits in the future.

The M915A5 tractor truck manufactured by Daimler Trucks North America LLC is a prime mover of flatbed and tanker semi-trailers used primarily to transport containers, bulk cargo and petroleum products over primary and secondary roads and trails under worldwide climatic conditions. It has a diesel engine, automatic transmission, anti-lock brakes, air conditioning, and a fully sliding 36 inch fifth wheel. It has a Gross Vehicle Weight Rating (GVWR) of 66,000 lbs and is compatible with the following trailers: M872 (34-ton flatbed trailer), M871 (22-1/2 ton flatbed trailer), M127 (12-ton stake trailer), M967/969 (5000-gallon trailer), M1062 (7500-gallon trailer), M1062A1

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) VR5 / TWV Protection Kits		
<p>(9200-gallon trailer), MILVAN, and commercial trailers. The M915A5 has two configurations, a base armor-ready A-Cab and an up-armored B-Kit. M915A5 underbody Protection Kits are required to protect the line haul fleet from current and future threats and add protection to the B-kit configuration.</p> <p>FY 2018 Project VR5 Base funds in the amount of \$5.757 million will be used to develop Heavy Dump Truck (HDT) armor. It will also be used to fund the design, prototype, and testing of axle/suspension/weapon station upgrades for the HEMTTA4/PLSA1. To include the conversion of the HEMTTA4/PLSA1 Underbody Armor Kit TDP from Prototype-level to Production-level and Systems Engineering/Program Management (SEPM) support.</p>				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Title: Heavy Dump Truck (HDT) Armor Development Description: Develop HDT Armor FY 2017 Plans: Procure HDT armor test assets FY 2018 Plans: Develop HDT Armor - contractor to design/engineer armor solution</p>		-	0.350	2.134
<p>Title: HEMTTA4/PLSA1 Suspension and Weapon Station Upgrade Description: Design new HEMTTA4 and PLSA1 axle and suspension components and integrate protected weapon station. FY 2018 Plans: Conduct studies, modeling and simulation, and Computer Aided Design (CAD) model and drawing creation, and create bill of materiel.</p>		-	-	1.273
<p>Title: HEMTTA4/PLSA1 Suspension and Weapon Station Upgrade - Prototype Axle, Suspension, and Protected Weapon Station Description: Build prototypes of the new HEMTTA4 /PLSA1 axle, suspension and protected weapon station integration designs. FY 2018 Plans: Order and receive parts, verify quality and assemble.</p>		-	-	1.000
<p>Title: HEMTTA4/PLSA1 Suspension and Weapon Station Upgrade - Test Description: Test prototypes of the new HEMTTA4/PLSA1 axle, suspension and protected weapon station. FY 2018 Plans: Install axles, suspension and protected weapon station. Perform automotive testing.</p>		-	-	0.500
<p>Title: HEMTTA4/PLSA1 Underbody Armor Kit TDP Conversion - Convert TDP</p>		-	-	0.270

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) VR5 / TWV Protection Kits		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Description: Convert current TDP into standard TDP format for Government use.</p> <p>FY 2018 Plans: Includes review by Configuration Management Team, revisions to CAD and drawings, and standardization to current requirements.</p>				
<p>Title: HEMTTA4/PLSA1 Underbody Armor Kit TDP Conversion - Conduct Fit-up</p> <p>Description: Verification of TDP.</p> <p>FY 2018 Plans: Conduct virtual installation of kit onto HEMTTA4/PLSA1 truck cabs.</p>		-	-	0.010
<p>Title: HEMTTA4/PLSA1 Underbody Armor Kit TDP Conversion - Release TDP</p> <p>Description: Officially release TDP into the TACOM Release System and place under change control.</p> <p>FY 2018 Plans: Create folder structure and placement of data into Windchill by Configuration Management Team.</p>		-	-	0.020
<p>Title: Systems Engineering/Program Management (SEPM) Support</p> <p>Description: SEPM 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 professional acquisition workforce.</p> <p>FY 2018 Plans: Includes program management, engineering and budget support for HDT and HEMTTA4/PLSA1 Suspension and Weapon Station Upgrade and TDP conversion.</p>		-	-	0.550
<p>Title: HDT System Engineering/Program Management (SEPM) Support</p> <p>Description: SEPM includes PM and System Engineering oversight required to conduct requirements analysis, specifications development, program management and contractor oversight. Salaries, Benefits, Travel, Personnel Training and other Government costs are included for retaining a professional acquisition workforce.</p> <p>FY 2017 Plans:</p>		-	0.250	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) VR5 / TWV Protection Kits

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Includes labor support for management of project (i.e., cost, schedule, performance); engineering (Technical Data Package (TDP) update, test support); Product Assurance Test and Evaluation (PAT&E) support.			
Title: M915A5 Underbody Armor - SEPM Description: SEPM includes PM and System Engineering oversight required to conduct requirements analysis, specification development, program management and contractor oversight. Salaries, Benefits, Travel, Personnel Training and other government costs are included for retaining a professional acquisition workforce. FY 2017 Plans: Includes labor support for management of project (i.e., cost, schedule, performance, Type Classification/Full Materiel Release); engineering (Technical Data Package update, test support); logistics (including Validation/Verification-VAL/VER, mechanics, tech writer); provisioning, Product Support Integration Directorate (PSID) support; Product Assurance Test and Evaluation (PAT&E) support. Travel includes 3 trips--2 to witness testing and 1 to conduct the VAL/VER.	-	0.739	-
Title: M915A5 Underbody Armor - Test and Evaluation Description: Develop, test and evaluate Underbody Armor for the M915A5 FY 2017 Plans: Develop and test an MRAP-level armor underbody solution for the M915A5 fleet. Testing will include automotive and ballistic testing to achieve Full Materiel Release (FMR) for the armor kit.	-	3.185	-
Accomplishments/Planned Programs Subtotals	-	4.524	5.757

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
• 010: Family of Heavy Tactical Vehicles (FHTV) (DA0500)	30.849	45.686	107.530	-	107.530	83.204	76.073	-	-	0	343.342
• 014: Tactical Wheeled Vehicle Protection Kits (D04003)	44.292	150.905	43.040	-	43.040	44.420	48.252	49.531	50.250	0	430.690
• 008: Family Of Medium Tactical Veh (FMTV) (D15500)	334.038	352.769	78.650	-	78.650	98.231	198.312	193.404	182.838	0	1,438.242
• 007: Truck, Dump, 20T (CCE) (D16001)	45.658	3.927	0.967	-	0.967	9.911	29.870	60.466	61.343	0	212.142

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604622A / Family of Heavy Tactical Vehicles	Project (Number/Name) VR5 / TWV Protection Kits

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

Heavy Dump Truck (HDT) Armor:

Overall strategy includes a contract to one Original Equipment Manufacturer (OEM) to develop an armor solution for a commercial dump truck. The commercial dump truck (capable of being armored) will be produced prior to the development of this armor solution. This armored solution will be tested prior to approval for build to incorporate to the HDT production. The armored HDT will be procured after successful completion of the armor live fire test in FY21.

Heavy Expanded Mobility Tactical Truck A4 (HEMTTA4) and Palletized Load System A1 (PLSA1) Suspension and Weapon Station Upgrade:

FY18 funds will be used to design, develop, prototype and test new axle, suspension components, and protected weapon station components. The new components will be tested and approved to be released as a stand-alone kit or revision to the current underbody armor kit (aka C-Kit).

HEMTTA4/PLSA1 Underbody Armor Kit Technical Data Package (TDP) Conversion from Prototype-level to Production-level:

FY18 funds will be used to convert and release a Production-level TDP. When complete, the kit can be procured.

E. Performance Metrics

The costs, schedule and technical (performance) requirements are reviewed and compared to the Acquisition Program Baseline (APB) on a regular basis. Meetings are held monthly to review and discuss status of each program. Schedules are monitored by the respective Integrated Product Team (IPT) to oversee and compare progress to APB timelines via an Integrated Master Schedule (IMS) for each program. All technical requirements are tested and confirmed prior to start of production. In addition, each program has the ability to perform added tests during production as required to assure technical requirements are being met. The product office also uses Project Recon to perform risk management. The tool is designed to capture, manage, and link Risks, Issues, and Opportunities in a centralized database to create an integrated model that covers the entire program lifecycle.

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604633A / <i>Air Traffic Control</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	-	9.714	3.421	3.536	-	3.536	12.199	7.752	8.334	7.629	Continuing	Continuing
586: <i>Air Traffic Control</i>	-	9.714	3.421	3.536	-	3.536	12.199	7.752	8.334	7.629	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element funds continuous efforts in the development of modernized tactical Air Traffic Control (ATC) systems that will enable safety of aircraft operations. ATC systems are required to achieve or maintain compliance with civil, military, domestic and international ATC mandates and combat identification requirements. Funding will be utilized to develop, evaluate and integrate technologies required to support ATC requirements. Efforts funded include the Tactical Airspace Integration System (TAIS) web based architecture and Common Operating Environment (COE) initiatives, Air Traffic Navigation Integration and Coordination System (ATNAVICS) Modernization, Advanced Surveillance, the development of an ATC Tactical Network, the Mobile Tower System (MOTS) Preplanned Product Improvement (P3I) upgrades, and Tactical Terminal Control System (TTCS) modernization.

TAIS, the Army's system of record for Airspace Control (AC) and enroute Air Traffic Services (ATS) within the Army Mission Command Information System (MCIS), requires the development and testing of web-based services for AC, and integration of these new web-based services into the TAIS common MCIS hardware, while meeting the COE standards. Additional capabilities will be provided through advanced surveillance and mission planning interfaces. TAIS efforts also include developing and testing improvements to the air picture including the addition of Blue Force Tracker correlation and radar fusion capability. TAIS develops software and required hardware for AC web services to operate effectively in a dynamic net-centric interconnected environment. TAIS also integrates advanced surveillance capabilities to further enhance airspace integration and dynamic management capabilities. ATNAVICS is an Airport Surveillance Radar (ASR) and Precision Approach Radar (PAR) system that provides ATS at Army terminal airfields and landing sites at Division, Corps, and Echelons Above Corps to include services for Joint and Allied aircraft. ATNAVICS will integrate Mode S capabilities required to control aircraft both Outside of the Continental United States (OCONUS) and Continental United States (CONUS). ATNAVICS will network its radar picture and interrogator data (Mode S) to aviation and joint network nodes through TAIS. ATNAVICS will undergo an effort to increase the range of the primary radar to 60 nautical miles. As the Department of Defense transitions military aircraft to positional self-reporting technologies, the flight information will be captured by the Advanced Surveillance program. Advanced Surveillance allows ATC reception of aircraft self-reporting data which includes the Automatic Dependent Surveillance Broadcast. Advanced Surveillance integrates local radar feeds and self-reporting aircraft positional data into a correlated situational awareness air picture. ATC Tactical Networking supports the non-recurring engineering, test and evaluation tasks necessary for the integration of the radios, control stations and transmitter/receivers and software that will provide all ATC tactical systems an airfield network node capability. This will enable each ATC system to send voice and data between ATC platforms including connectivity to an external network for long range flight-following and data exchange further reducing aviation operational risk by providing all ATC operators a common air picture. ATC Networking is required to meet the Net Ready Key Performance Parameter for ATC tactical systems. MOTS provides the Joint Force Commander or Combatant Commander a highly mobile, self-contained, integrated and reliable information system platform for visual and procedural aircraft deconfliction and aircrew force protection in unified action terminal airspace environments. The Airfield Lighting System (ALS) is a component of the MOTS and can be operated by solar power or by generator power. The ALS improvements include a Precision Approach Path Indicator and an ALS trailer charging system. The TTCS is a mobile ATC communications system that provides initial ATS at remote landing sites and drop zones. It enables secure ground-to-air and ground-to-ground communications between Army aircraft, other services, Allied aircraft and ground stations. TTCS also provides aircraft separation and ground control capabilities, a meteorological measuring system for basic weather information, Blue Force Tracker which provides near real time situational awareness

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604633A / <i>Air Traffic Control</i>
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and precision location capability. Future improvements include incorporating advance surveillance as risk mitigation by improving airspace situational awareness and providing an improved soldier interface that is common with other ATC systems.

The FY 2018 funding request was reduced by \$3.374 million to account for the availability of prior year execution balances.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	10.076	3.421	6.749	-	6.749
Current President's Budget	9.714	3.421	3.536	-	3.536
Total Adjustments	-0.362	0.000	-3.213	-	-3.213
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.362	-			
• Adjustments to Budget Years	0.000	0.000	-3.213	-	-3.213

Change Summary Explanation

FY 2018 reflects funding adjustments for under-execution (-\$3.374 million), inflation (+\$0.156 million), and miscellaneous decrement (-\$0.001 million).

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604633A / <i>Air Traffic Control</i>				Project (Number/Name) 586 / <i>Air Traffic Control</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
586: <i>Air Traffic Control</i>	-	9.714	3.421	3.536	-	3.536	12.199	7.752	8.334	7.629	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds continuous efforts in the development of modernized tactical Air Traffic Control (ATC) systems that will enable safety of aircraft operations. ATC systems are required to achieve or maintain compliance with civil, military, domestic and international ATC mandates and combat identification requirements. Funding will be utilized to develop, evaluate and integrate technologies required to support ATC requirements. Efforts funded include the Tactical Airspace Integration System (TAIS) web based architecture and Common Operating Environment (COE) initiatives, Air Traffic Navigation Integration and Coordination System (ATNAVICS) Modernization, the development of an ATC Tactical Network, the Mobile Tower System (MOTS) Preplanned Product Improvement (P3I) upgrades, and Tactical Terminal Control System (TTCS) modernization.

TAIS, the Army's system of record for Airspace Control (AC) and enroute Air Traffic Services (ATS) within the Army Mission Command Information System (MCIS), requires the development and testing of web-based services for AC, and integration of these new web-based services into the TAIS common MCIS hardware, while meeting the COE standards. Additional capabilities will be provided through advanced surveillance and mission planning interfaces. TAIS efforts also include developing and testing improvements to the air picture including the addition of Blue Force Tracker correlation and radar fusion capability. TAIS develops software and required hardware for AC web services to operate effectively in a dynamic net-centric interconnected environment. TAIS also integrates advanced surveillance capabilities to further enhance airspace integration and dynamic management capabilities. ATNAVICS is an Airport Surveillance Radar (ASR) and Precision Approach Radar (PAR) system that provides ATS at Army terminal airfields and landing sites at Division, Corps, and Echelons Above Corps to include services for Joint and Allied aircraft. ATNAVICS will integrate Mode S capabilities required to control aircraft both Outside of the Continental United States (OCONUS) and Continental United States (CONUS). ATNAVICS will network its radar picture and interrogator data (Mode S) to aviation and joint network nodes through TAIS. ATNAVICS will undergo an effort to increase the range of the primary radar to 60 nautical miles. As the Department of Defense transitions military aircraft to positional self-reporting technologies, the flight information will be captured by the Advanced Surveillance program. Advanced Surveillance allows ATC reception of aircraft self-reporting data which includes the Automatic Dependent Surveillance Broadcast. Advanced Surveillance integrates local radar feeds and self-reporting aircraft positional data into a correlated situational awareness air picture. ATC Tactical Networking supports the non-recurring engineering, test and evaluation tasks necessary for the integration of the radios, control stations and transmitter/receivers and software that will provide all ATC tactical systems an airfield network node capability. This will enable each ATC system to send voice and data between ATC platforms including connectivity to an external network for long range flight-following and data exchange further reducing aviation operational risk by providing all ATC operators a common air picture. ATC Networking is required to meet the Net Ready Key Performance Parameter for ATC tactical systems. MOTS provides the Joint Force Commander or Combatant Commander a highly mobile, self-contained, integrated and reliable information system platform for visual and procedural aircraft deconfliction and aircrew force protection in unified action terminal airspace environments. The Airfield Lighting System (ALS) is a component of the MOTS and can be operated by solar power or by generator power. The ALS improvements include a Precision Approach Path Indicator and an ALS trailer charging system. The TTCS is a mobile ATC communications system that provides initial ATS at remote landing sites and drop zones. It enables secure ground-to-air and ground-to-ground communications between Army aircraft, other services, Allied aircraft and ground stations. TTCS also provides aircraft separation and ground control capabilities, a meteorological measuring system for basic weather information, Blue Force Tracker which provides near real time situational awareness

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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 / 5	R-1 Program Element (Number/Name) PE 0604633A / <i>Air Traffic Control</i>	Project (Number/Name) 586 / <i>Air Traffic Control</i>
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and precision location capability. Future improvements include incorporating advance surveillance as risk mitigation by improving airspace situational awareness and providing an improved soldier interface that is common with other ATC systems.

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

	FY 2016	FY 2017	FY 2018
<p>Title: Tactical Airspace Integration System (TAIS)</p> <p>Description: TAIS Airspace Information Center (AIC), Common Operating Environment (COE) and Airspace Integration Improvements Initiative enhancements will be addressed through upgrades to the communications suite through new components such as 117G radios, BFT2/KGV-72, and ADS-B. TAIS develops software and required hardware for airspace management web services to operate effectively in a dynamic net-centric interconnected COE environment. TAIS will also integrate advanced surveillance interfaces and passive receiver to further enhance a dynamic airspace management capability.</p> <p>FY 2016 Accomplishments: Continued development of sensor and data interfaces to Civil Aviation agencies in support of military and homeland defense Air Traffic Services and Airspace Management Command and Control. In order to meet COE requirements, continued development of web services and service oriented architecture with Joint systems to facilitate Air Traffic services and Airspace Command and Control across DoD agencies, Federal agencies, COE and Allied Nations. Continued to address Airspace Integration Improvements Initiative enhancements through upgrades to the communications suite through new components such as 117G radios, BFT2/KGV-72 and ADS-B. Continued to develop and refine interfaces to cooperative and non-cooperative sensor and self-reporting aircraft in support of Situational Awareness and airspace management and de-confliction. Developed deployable web based capabilities to enable disconnected off grid operations via non-line-of-sight communications and disjointed edge user nodes in support of ATC and ATS. Developed an embedded computer-based, Adaptive Learning Environment (ALE) to advance operator proficiency and adaptive decision-making capabilities.</p> <p>FY 2017 Plans: Continue to develop sensor and data interfaces to Civil Aviation agencies in support of military and homeland defense Air Traffic Services and Airspace Management Command and Control. Continue to develop web services and service oriented architecture with Joint systems to facilitate Air Traffic services and Airspace Command and Control across DoD agencies, Federal agencies, COE and with Allied Nations. Continue to develop dynamic mission updates and interfaces with Unmanned Aerial Systems and DoD/Joint Air platforms for situational awareness. Continue to develop and refine interfaces to cooperative and non-cooperative sensor and self-reporting aircraft in support of Situational Awareness and airspace management and de-confliction. Develop rapidly deployable web based capabilities to enable disconnected off grid operations via non-line-of-sight communications and disjointed edge user nodes in support of ATC and ATS. Continue to develop a computer-based, adaptive learning environment (ALE) to advance operator proficiency and adaptive decision-making capabilities. Continue incorporation of automated forms such as electronic flight strips, duty and facility logs within the ATC network environment strips, duty and facility logs and ATC records within the ATC network environment. Continue to reduce TAIS operator workload by simplifying software operations.</p> <p>FY 2018 Plans:</p>	4.733	2.184	0.679

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604633A / Air Traffic Control	Project (Number/Name) 586 / Air Traffic Control
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
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<p>Continue ongoing COE, Joint Interoperability Testing and Network Integration Event test and certification in support of the interoperability within the Army's Mission Command Information System (MCIS). Incorporate emerging Federal Aviation Administration (FAA) requirements. Develop software solutions to provide FAA Notice to Airman, Pilot Reports and Temporary Flight Restrictions. Develop system and user defined quality of service and performance tools to monitor and adjust critical performance and loading of software. Develop real time retrieval of AMPS mission data using a web-service and end points. Continue System Modification 2 testing including transportability, mobility and Electro Magnetic Environmental Effects (E3) tests.</p>			
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<p>Title: Air Traffic Navigation Integration and Coordination System (ATNAVICS) Modernization</p> <p>Description: ATNAVICS is a highly mobile tactical area surveillance and precision approach air traffic control radar system. It provides the Joint Force Commander or Combatant Commander, with a mobile, self-contained and reliable Airport Surveillance Radar, Precision Approach Radar and a Secondary Surveillance Radar capability. System modernization includes radar interrogation enhancements.</p> <p>FY 2016 Accomplishments: Completed box level development, testing, and certification of Mode S. Began system level development, testing, certification and integration of Mode S and ADS-B secondary surveillance radar capability into the ATNAVICS Platform. This will enable ATNAVICS to be compliant with International Civil Aviation Organization (ICAO) and FAA mandates.</p> <p>FY 2018 Plans: Provide Risk Management Framework to ATNAVICS to comply with Cyber Security requirements and Army Test Evaluation Command testing required for Full Material Release.</p>	2.083	-	1.462
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<p>Title: Mobile Tower System (MOTS) P3I</p> <p>Description: MOTS is a rapidly deployable Air Traffic Control System supporting operations at military/civilian airfields and tactical landing zones. It provides the ATC tower with secure, anti-jam communications, basic weather information, and precision location. The system includes an Airfield Lighting System that provides a visual indication of landing zone and runway locations in degraded conditions.</p> <p>FY 2016 Accomplishments: Conducted nonrecurring engineering, test, and evaluation tasks necessary for the development and integration of amplifiers for 117G radios, ARC-220 replacement and universal power supply (UPS). The 117G amplifier increased the range of the 117G radios to allow the system to meet the 30 nautical mile range threshold requirement. The placement of UPS in the MOTS was re-engineered to address human factors issues on the current design.</p> <p>FY 2017 Plans: Conduct nonrecurring engineering, test and evaluation tasks necessary for the development and integration of remote operation (300 ft) and advanced batteries. The remote operation (300 ft) will improve safety and functionality by providing the MOTS the</p>	2.200	1.237	-
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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604633A / Air Traffic Control	Project (Number/Name) 586 / Air Traffic Control
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
capability to be remotely operated up to 300 ft away from the shelter. The advanced batteries replacement will allow the MOTS to meet its threshold requirement for extreme cold weather operation and storage.			
<p>Title: Tactical Terminal Control System (TTCS)</p> <p>Description: The TTCS is a mobile ATC communications system that provides initial ATS at remote landing sites and drop zones. It enables secure ground-to-air and ground-to-ground communications between Army aircraft, other services, Allied aircraft and ground stations. TTCS also provides aircraft separation and ground control capabilities, a meteorological measuring system for basic weather information, and Blue Force Tracker which provides near real time situational awareness and precision location capability.</p> <p>FY 2016 Accomplishments: Continued development of the Tactical Operations Center Network Inter-Communication System (TOCNET) Commonality Modification Work Order. The effort integrates the Soft Crew Access Unit and the Passive Detecting Receiving System.</p> <p>FY 2018 Plans: Conduct nonrecurring engineering test and evaluation tasks necessary for the development and integration of the ATC Tactical Network. The ATC Tactical Network effort will enable the TTCS to share air traffic control data with the other tactical PM ATC platforms.</p>	0.320	-	0.883
<p>Title: Program Management (PM) Support</p> <p>Description: PM support of PM ATC</p> <p>FY 2016 Accomplishments: Continued program management support of PM ATC.</p> <p>FY 2018 Plans: Continue program management support of PM ATC.</p>	0.378	-	0.512
Accomplishments/Planned Programs Subtotals	9.714	3.421	3.536

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>
• Air Traffic Control (AA0050): Air Traffic Control	94.544	53.405	83.790	-	83.790	69.589	47.469	54.922	51.632	Continuing	Continuing

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604633A / <i>Air Traffic Control</i>	Project (Number/Name) 586 / <i>Air Traffic Control</i>
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D. Acquisition Strategy

This project is comprised of multiple systems supporting ATC development and test efforts. While the detailed acquisition strategy varies by program, the general strategy for each program is to complete development and testing efforts through contract modifications, engineering service tasks, and new/follow-on contracts. ATC systems are required to achieve or maintain compliance with civil, military, domestic and international air traffic control and upcoming Next Gen requirements and mandates as well as current aircraft self-reporting transponders.

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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604641A / <i>TACTICAL UNMANNED GROUND VEHICLE</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	-	13.599	39.282	0.000	-	0.000	0.000	0.000	16.000	23.000	Continuing	Continuing
DV7: <i>Small Unmanned Ground Vehicle</i>	-	13.599	39.282	0.000	-	0.000	0.000	0.000	16.000	23.000	Continuing	Continuing

Note

FY 2018 and out year funding has been moved to fund individual Project Numbers as follows: Common Robotic Systems - Individual (CRS(I) Program Element 655053 Project FB4; Robotics Enhanced Program (REP) Program Element 655053 Project FB7; Robotics Architecture (RA) Program Element 655053 Project FB3; Robotics Development (RD) Program Element 644017 Project FD2 and Program Element 644017 Project FD9.

A. Mission Description and Budget Item Justification

The Common Robotic System – Individual (CRS(I)) will be a man-packable, small (<25lbs), highly mobile, unmanned robotic system with advanced sensors/mission modules for dismounted Service Members. The CRS(I) will be designed so operator can quickly re-configure for other various missions by adding or removing modules and/or payloads. The CRS(I) will also include the Army universal controller used by all unmanned ground and aerial vehicles within the battalion formation providing interoperability, logistics, and training efficiencies. The CRS(I) will provide interrogation, detection, confirmation, and neutralization capabilities employed to support a wide spectrum of mobility missions for current and future forces. This capability provides commanders the ability to persistently monitor the Operating Environment (OE) while protecting and sustaining the force. The CRS(I) complements the Joint Integrated War-fighting Force by providing standoff to the War fighter during major combat, stability, and homeland security operations.

The Robotics Enhanced Program (REP) uses a “buy, try, and inform” methodology to evaluate Commercial Off the Shelf (COTS), Government Off the Shelf (GOTS) and Non-Developmental Item (NDI) products that have the potential to enhance Soldier combat effectiveness. Actual operational user feedback and evaluation results obtained will inform emerging capabilities and requirements documents in support of a Cost-Benefit Analysis to support future Army decision making.

Robotics Architecture (RA) provides the engineering and development resources to manage the overarching architecture for robotic systems that are both modular and interoperable across the Joint Force in order to facilitate future modernization efforts. It will manage the interoperability standards, modular payload interface, common software and universal controllers. RA includes the construction of program specific Interoperability Profiles (IOP) (i.e. Small Multipurpose Equipment Transport (SMET), Leader/Follower (LF), Route Clearance Interrogation System (RCIS), Common Robotics System-Vehicle (CRS(V)), CRS(I) Inc II, etc.) and new standards addressing emerging requirements (i.e. Cyber Security, Information Assurance, new payloads, etc).

Robotics Development (RD) includes efforts necessary to evaluate integrated technologies, validate material solutions and determine initial Analysis of Alternatives (AoA) in support of pre-material 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, 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, 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. SMET, Leader/

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604641A / <i>TACTICAL UNMANNED GROUND VEHICLE</i>
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Follower (LF), Route Clearance Interrogation Systems (RCIS), CRS(V), CRS(I) Inc II, Soldier Born Sensors, etc) to determine Technology Readiness Levels (TRL) and Manufacturing Readiness Levels (MRL). Studies support AoA that include Army Material Systems Analysis Activity (AMSAA), RAND Corporatin studies, and/or modeling to increase confidence in the material 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.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	15.374	39.282	60.120	-	60.120
Current President's Budget	13.599	39.282	0.000	-	0.000
Total Adjustments	-1.775	0.000	-60.120	-	-60.120
• Congressional General Reductions	-1.775	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments 1	0.000	0.000	-60.120	-	-60.120

Change Summary Explanation

FY 2018 and out year funding has been moved to fund individual Project Numbers as follows: Common Robotic Systems - Individual (CRS(I) Program Element 655053 Project FB4; Robotics Enhanced Program (REP) Program Element 655053 Project FB7; Robotics Architecture (RA) Program Element 655053 Project FB3; Robotics Development (RD) Program Element 644017 Project FD2 and Program Element 644017 Project FD9.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604641A / TACTICAL UNMANNED GROUND VEHICLE			Project (Number/Name) DV7 / Small Unmanned Ground Vehicle				
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
DV7: <i>Small Unmanned Ground Vehicle</i>	-	13.599	39.282	0.000	-	0.000	0.000	0.000	16.000	23.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2018 and out year funding has been moved to fund individual Project Numbers as follows: Common Robotic Systems - Individual (CRS(I) Program Element 655053 Project FB4; Robotics Enhanced Program (REP) Program Element 655053 Project FB7; Robotics Architecture (RA) Program Element 655053 Project FB3; Robotics Development (RD) Program Element 644017 Project FD2 and Program Element 644017 Project FD9.

A. Mission Description and Budget Item Justification

The Common Robotic System – Individual (CRS(I)) will be a man-packable, small (<25lbs), highly mobile, unmanned robotic system with advanced sensors/mission modules for dismounted Service Members. The CRS(I) will be designed so operator can quickly re-configure for other various missions by adding or removing modules and/or payloads. The CRS(I) will also include the Army universal controller used by all unmanned ground and aerial vehicles within the battalion formation providing interoperability, logistics, and training efficiencies. The CRS(I) will provide interrogation, detection, confirmation, and neutralization capabilities employed to support a wide spectrum of mobility missions for current and future forces. This capability provides commanders the ability to persistently monitor the Operating Environment (OE) while protecting and sustaining the force. The CRS(I) complements the Joint Integrated Warfighting Force by providing standoff to the Warfighter during major combat, stability, and homeland security operations.

The Robotics Enhanced Program (REP) uses a “buy, try, and inform” methodology to evaluate Commercial Off the Shelf (COTS), Government Off the Shelf (GOTS) and Non-Developmental Item (NDI) products that have the potential to enhance Soldier combat effectiveness. Actual operational user feedback and evaluation results obtained will inform emerging capabilities and requirements documents in support of a Cost-Benefit Analysis to support future Army decision making.

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Robotics Development (RD) includes efforts necessary to evaluate integrated technologies, validate material solutions and determine initial Analysis of Alternatives (AoA) in support of pre-material 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, 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, 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. SMET, Leader/

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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 / 5	R-1 Program Element (Number/Name) PE 0604641A / <i>TACTICAL UNMANNED GROUND VEHICLE</i>	Project (Number/Name) DV7 / <i>Small Unmanned Ground Vehicle</i>
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Follower (LF), Route Clearance Interrogation Systems (RCIS), CRS(V), CRS(I) Inc II, Soldier Born Sensors, etc) to determine Technology Readiness Levels (TRL) and Manufacturing Readiness Levels (MRL). Studies support AoA that include Army Material Systems Analysis Activity (AMSAA), RAND Corporation studies, and/or modeling to increase confidence in the material 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.

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

	FY 2016	FY 2017	FY 2018
<p>Title: CRS-I and emerging robotic requirements.</p> <p>Description: The CRS-I program expects a Material Development Decision (MDD) in FY16. In FY15, CRS-I completed AoA letter of sufficiency, began the program Test & Evaluation Working-Level Integrated Product Team (T&E WIPT), formed a CRS-I program IPT to support the acquisition process. An IPT was formed to support emerging robotic system requirements and REP.</p> <p>FY 2016 Accomplishments: The CRS(I) program received MDA delegation as ACAT III with Milestone Decision Document (MDD) and an Acquisition Decision Memorandum (ADM) to complete entrance criteria for MS B. Systems engineering activities included drafting of the Test Evaluation Master Plan (TEMP), System Engineering Plan (SEP) and performance specification for Request For Proposals (RFP) release. The product support Integrated Product Team (IPT) drafted the (LCSP) for RFP release. CRS(I) collaborated with appropriate Program Executive Offices (PEO)for development of common radio, universal controller architecture and modeling and simulation. The procurement specialist conducted and compiled results from a Request For Information (RFI) from industry, a draft RFP with an industry day and prepared for release of the development RFP.</p> <p>The REP program utilized an established website where industry and government submits initiative proposals. Per standard operating procedure (SOP) and Memorandum of Agreement (MOA) between PEO CS&CSS and TRADOC/MCOE, a monthly stakeholders working group has proven continually effective in reviewing emerging capabilities leading towards a biannual Council of Colonels (CoC) review and selections of proposals in support of Center of Excellence (CoE) determined REP initiatives. Industry and government responses indicated proposal experimentation in support of these initiatives could exceed a \$10 million level of effort. REP 16.1 and 16.2 initiatives were conducted at Ft Benning and Ft Leonard Wood to inform emerging requirements.</p> <p>FY 2017 Plans: The CRS(I) program will enter MS B, conduct a source selection board and complete EMD contract award(s) beginning in 3QFY17. REP will continue to inform emerging robotic system requirements and risk reduction initiatives per SOP and MOA, to include 16.1 and 16.2 project reviews and complete REP 17.1and 17.2 demonstrations. REP initiatives will be completed and published for PEO review at Knowledge Point 2 for program effectiveness and efficiency. RA will monitor, validate, and update IOP for MTRS and CRS(I) instantiations as well as continuous revision for cyber security and information assurance. RA will also initiate development of SMET and LF instantiations.</p>	13.599	39.282	-

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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 / 5	R-1 Program Element (Number/Name) PE 0604641A / TACTICAL UNMANNED GROUND VEHICLE	Project (Number/Name) DV7 / Small Unmanned Ground Vehicle
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
RD will initiate Pre-MDD activities to support AoA and draft CDD for SMET, LF and RCIS to include follow-on S&T activities and REP to support emerging requirements.			
Accomplishments/Planned Programs Subtotals	13.599	39.282	-

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
• G99595: Common Robotic System-Individual (CRS-I)	-	-	-	-	-	3.200	8.400	28.958	45.291	Continuing	Continuing

Remarks

D. Acquisition Strategy
CRS(I) will enter MS-B as an ACAT III program, and the Acquisition Strategy was completed in Jan 2017. CRS(I) strategy to include the following considerations: Full and open competition contract (i.e. cost plus fixed fee for EMD and Firm Fixed Price (FFP) for LRIP and Production).

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 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604642A / LIGHT TACTICAL WHEELED VEHICLES
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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	0.494	7.000	-	7.000	8.300	3.000	2.000	2.000	0.000	22.794
E40: LTV Prototype	-	0.000	0.494	7.000	-	7.000	8.300	3.000	2.000	2.000	0.000	22.794

Note

Ground Mobility Vehicle (GMV) is a new start program in FY17. This project includes GMV and Joint Light Tactical Vehicle - Reconnaissance Vehicle (JLTV-RV).

A. Mission Description and Budget Item Justification

The Army Ground Mobility Vehicle (GMV) provides enhanced tactical mobility for an Infantry Brigade Combat Team (IBCT) 9-Soldier infantry squad with their associated equipment to move quickly around the battlefield. This capability is required across the range of military operations facing IBCT units conducting crises response, initial entry, and selected decisive action missions. GMV deploys worldwide by sea, air, and land modes to support strategic deployment and operational maneuver in accordance with Army and Joint doctrine. This capability provides flexibility for entry operations (permissive and non-permissive) to counter threat anti-access strategies by using multiple austere entry points to bring in combined arms configured units.

The Joint Light Tactical Vehicle - Reconnaissance Vehicle (JLTV-RV) was designated as the interim solution (2016 AROCM16-11.2) for the Light Reconnaissance Vehicle (LRV) to address a near term capability gap identified in the U.S. Army Combat Vehicle Modernization Strategy for the IBCT Cavalry Squadrons and Infantry Battalion Scout Platoons. This effort includes increased precision lethality through improved optics and a larger caliber weapon system to provide overmatch and counter threats as forces perform reconnaissance, surveillance and security operations.

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	0.494	1.000	-	1.000
Current President's Budget	0.000	0.494	7.000	-	7.000
Total Adjustments	0.000	0.000	6.000	-	6.000
• 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	6.000	-	6.000

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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 5: System Development & Demonstration (SDD)*

R-1 Program Element (Number/Name)
PE 0604642A / *LIGHT TACTICAL WHEELED VEHICLES*

Change Summary Explanation

FY 2018 Project E40 Base funds in the amount of \$6.000 million will be used for Joint Light Tactical Vehicle - Reconnaissance Vehicle (JLTV-RV) test assets. JLTV-RV was designated as the interim solution (2016 AROCM16-11.2) for the Light Reconnaissance Vehicle (LRV) to address a near term capability gap identified in the U.S. Army Combat Vehicle Modernization Strategy for the IBCT Cavalry Squadrons and Infantry Battalion Scout Platoons.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604642A / LIGHT TACTICAL WHEELED VEHICLES	Project (Number/Name) E40 / LTV 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
E40: LTV Prototype	-	0.000	0.494	7.000	-	7.000	8.300	3.000	2.000	2.000	0.000	22.794
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Ground Mobility Vehicle (GMV) is a new start program in FY17. This project includes GMV and Joint Light Tactical Vehicle - Reconnaissance Vehicle (JLTV-RV).

A. Mission Description and Budget Item Justification

The Army Ground Mobility Vehicle (GMV) provides enhanced tactical mobility for an Infantry Brigade Combat Team (IBCT) 9-Soldier infantry squad with their associated equipment to move quickly around the battlefield. This capability is required across the range of military operations facing IBCT units conducting crises response, initial entry, and selected decisive action missions. GMV deploys worldwide by sea, air, and land modes to support strategic deployment and operational maneuver in accordance with Army and Joint doctrine. This capability provides flexibility for entry operations (permissive and non-permissive) to counter threat anti-access strategies by using multiple austere entry points to bring in combined arms configured units.

The Joint Light Tactical Vehicle - Reconnaissance Vehicle (JLTV-RV) was designated as the interim solution (2016 AROCM16-11.2) for the Light Reconnaissance Vehicle (LRV) to address a near term capability gap identified in the U.S. Army Combat Vehicle Modernization Strategy for the IBCT Cavalry Squadrons and Infantry Battalion Scout Platoons. This effort includes increased precision lethality through improved optics and a larger caliber weapon system to provide overmatch and counter threats as forces perform reconnaissance, surveillance and security operations.

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

	FY 2016	FY 2017	FY 2018
Title: GMV Test Vehicles	-	0.494	-
Description: Purchase GMV Test Vehicles			
FY 2017 Plans: Contract award for two each GMV Test Vehicles for destructive testing such as Low Velocity Air Drop (LVAD), Roll over and Durability.			
Title: GMV Testing	-	-	1.450
Description: GMV Operational testing, LVAD, rollover and durability testing			
FY 2018 Plans: Developmental Testing of 9-man seating kit, operational testing, LVAD, rollover and durability testing will take place at various locations to prove the vehicle is effective, survivable and sustainable.			
Title: GMV Program Management Support	-	-	0.160

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604642A / LIGHT TACTICAL WHEELED VEHICLES	Project (Number/Name) E40 / LTV Prototype
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Description: Personnel and travel FY 2018 Plans: Funding personnel and travel related to test support of GMV.			
Title: GMV Seating Kit Description: Development of GMV Seating kit to obtain 9-man seating kit. FY 2018 Plans: Development of the GMV seating kit	-	-	0.390
Title: JLTV-RV Mission Equipment Packages (MEP) Description: Effort to design/develop the integration kit for the improved optics and weapon system of JLTV. FY 2018 Plans: Contract award of work directive on current JLTV contract.	-	-	0.328
Title: JLTV-RV Test Assets Description: Purchase JLTV-RV MEP test assets. FY 2018 Plans: Test assets for performance testing, Log Demo and Limited User Test.	-	-	4.139
Title: JLTV-RV Program Management Support Description: Personnel and Travel FY 2018 Plans: Funding to support program management efforts.	-	-	0.533
Accomplishments/Planned Programs Subtotals	-	0.494	7.000

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
• D15505: Ground Mobility Vehicle D15505 OPA	-	4.907	40.935	-	40.935	48.078	50.956	50.000	50.000	0.000	244.876

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604642A / <i>LIGHT TACTICAL WHEELED VEHICLES</i>	Project (Number/Name) E40 / <i>LTV Prototype</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

GMV Phase I: Per the Directed Requirement procure the GMV capability for 5 Airborne IBCTS through the SOCOM GMV1.1 contract.
 GMV Phase II: Pursue development of the GMV to fulfill the requirements for the remainder of the IBCTs using a Commercial off the shelf or Non-developmental Item vehicle. A firm fixed priced contract will be awarded through full and open competition. Funding for Phase 2 will be competed in the FY19-23 POM with an expectation that contract award would be in FY20.

Pursue development of the JLTV-RV to fulfill near term capability gap identified in the U.S. Army Combat Vehicle Modernization Strategy for the Infantry Brigade Combat Team (IBCT) Cavalry Squadrons and Infantry Battalion Scout Platoons. The JLTV-RV MEP will be incorporated into the current JLTV Technical Data Battalion Scout Platoons. The JLTV-RV MEP will be incorporated into the current JLTV Technical Data Package (TDP) and will be a kit option on the next JLTV contract. The program is planning for the next production contract to be awarded through full and open competition.

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 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604645A / Armored Systems Modernization (ASM) - Eng 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	9.678	36.242	-	36.242	90.159	150.211	201.691	169.433	Continuing	Continuing
EV8: Mobile Protected Firepower	-	0.000	9.678	36.242	-	36.242	90.159	150.211	201.691	169.433	Continuing	Continuing

A. Mission Description and Budget Item Justification

Infantry Brigade Combat Teams (IBCTs) lack the mobile protected firepower capability necessary to defeat enemy prepared positions, destroy enemy armored vehicles, close with the enemy through fire and maneuver, and ensure freedom of maneuver and action in close contact with the enemy. Mobile Protected Firepower (MPF) will provide the protected, long range, precision direct-fire capability to ensure freedom of movement and action during offensive operations or defeat attacking enemy during defensive operations.

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	9.678	9.808	-	9.808
Current President's Budget	0.000	9.678	36.242	-	36.242
Total Adjustments	0.000	0.000	26.434	-	26.434
• 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	26.434	-	26.434

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604645A / Armored Systems Modernization (ASM) - Eng Dev	Project (Number/Name) EV8 / Mobile Protected Firepower
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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
EV8: Mobile Protected Firepower	-	0.000	9.678	36.242	-	36.242	90.159	150.211	201.691	169.433	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Infantry Brigade Combat Teams (IBCTs) lack the mobile protected firepower capability necessary to defeat enemy prepared positions, destroy enemy armored vehicles, close with the enemy through fire and maneuver, and ensure freedom of maneuver and action in close contact with the enemy. Mobile Protected Firepower (MPF) will provide the protected, long range, precision direct-fire capability to ensure freedom of movement and action during offensive operations or defeat attacking enemy during defensive operations.

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

	FY 2016	FY 2017	FY 2018
Title: Government Engineering and Project Management	-	9.678	36.242
Description: Funding is provided for the following effort			
FY 2017 Plans: Provides for basic Government oversight of the Mobile Protected Firepower (MPF) program. Includes funding for government personnel (labor, travel, training, supplies) and other support (other government agencies, support contractors, automated data processing, communications, and equipment). Initiation of the MPF Analysis of Alternatives (AoA), which will assess the Operational effectiveness, suitability, and life-cycle cost of materiel solutions that satisfy requirements contained within the MPF Initial Capabilities Document (ICD) and the draft Capability Development Document (CDD). The results of the MPF AoA will provide critical information to support a Milestone B in 2QFY2019. Work on milestone documentation, development of the Performance Specification, initiate the Request for Proposal (RFP) package which will have 2 draft releases (3Q and 4QFY2017) with final package to be released in 2QFY2018, and conduct Acquisition Strategy Panel (ASP) review with AAE for approval of acquisition approach in 3QFY17. In addition PM office is coordinating with ARDEC, Watervliet Arsenal and Rock Island to initiate a Risk Reduction program for the production of lethality systems (large caliber weapons).			
FY 2018 Plans: Conduct Development RFP Release Decision Point by 1QFY2018 for approval to release RFP by 1QFY2018. Conduct a Source Selection Evaluation Board (SSEB) along with several Peer Reviews during RFP development and prior to SSEB selection. SSEB will encompass a paper proposal along with Bid Sample which will be evaluated. Includes funding for government personnel (labor, travel, training, and supplies) and other support (other government agencies, support contractors, automated data processing, communications, and equipment). In addition PM will be funding ARDEC, Watervliet Arsenal and Rock Island Arsenal			

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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 / 5	R-1 Program Element (Number/Name) PE 0604645A / <i>Armored Systems Modernization (ASM) - Eng Dev</i>	Project (Number/Name) EV8 / <i>Mobile Protected Firepower</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
to procure material, build and test up to 20 large caliber gun tubes that would be used for Bid Sample vehicles and Prototypes which will be delivered in 2019.			
Accomplishments/Planned Programs Subtotals	-	9.678	36.242

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>
• Mobile Protected Firepower (G80820): <i>Mobile Protected Firepower (G80820)</i>	-	-	-	-	-	10.000	40.000	69.470	215.684	Continuing	Continuing

Remarks

D. Acquisition Strategy
 Mobile Protected Firepower (MPF) Materiel Development Decision (MDD) occurred on 1QFY17. The AAE approved the MPF program to enter the Material Solution Phase and begin the Analysis of Alternative (AoA) to assess the operational effectiveness, suitability, and life-cycle cost of potential materiel solutions that satisfy requirements contained within the MPF Initial Capabilities Document (ICD) and the draft Capability Development Document (CDD). Materiel Solution Analysis will support a future decision to enter at Milestone B in 2QFY2019. MPF strategy is to pursue a modified Non-Developmental Item (NDI) platform. EMD phase is scheduled to begin in FY19 and last thru FY22 with an anticipated MS C by FY22.

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 / 5	R-1 Program Element (Number/Name) PE 0604645A / <i>Armored Systems Modernization (ASM) - Eng Dev</i>	Project (Number/Name) EV8 / <i>Mobile Protected Firepower</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			
Project Management Office	RO	Government Warren MI; : Various	0.000	-		9.678	Dec 2016	15.219	Dec 2017	-		15.219	Continuing	Continuing	0.000
105mm Risk Assessment	TBD	Government Picatinny Arsenal, NJ, Watervliet Arsenal, NY, Rock Island Arsenal, IL : Various	0.000	-		-		21.023	Dec 2017	-		21.023	0.000	21.023	0.000
Subtotal			0.000	-		9.678		36.242		-		36.242	-	-	0.000

Remarks
FY18 funding will be used to support preparation of the RFP package (Scope of Work, CDRL development, L&M language, contracting strategies, OSD Peer Reviews, SSEB, etc.)

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	-	9.678		36.242	-	-	0.000

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604645A / Armored Systems Modernization (ASM) - Eng Dev	Project (Number/Name) EV8 / Mobile Protected Firepower
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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) Alternative of Analysis (AoA) / Army Requirements Oversight Council					▲ 1 AoA AROC																							
(2) Acquisition Strategy Panel (ASP)					▲ 2 ASP																							
(3) AROC Capabilities Development Document (CDD)					▲ 3 CDD AROC Approved																							
(4) Joint Requirements Oversight Council (JROC) CDD					▲ 4 CDD JROC Approved																							
Request for Proposal (RFP)													■ RFP															
Risk Reduction of Large Caliber Weapon System													Risk Reduction of Large Caliber Weapon System															
Source Selection Eval Board (SSEB) / Paper Proposals & Bid Samples									SSEB																			
(5) Mileston (MS) B													▲ 5 MS B															
(6) Contract Award (EMD)													▲ 6 Contract Award (EMD)															
MPF EMD													MPF EMD															
Large Caliber Weapon System Delivery													Large Caliber Weapon System Delivery															
MPF Prototype Deliveries (20)																	MPF Prototype Deliveries (20)											
Production Prove-out Testing																					Production Prove-out Testing							

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604645A / <i>Armored Systems Modernization (ASM) - Eng Dev</i>	Project (Number/Name) EV8 / <i>Mobile Protected Firepower</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												
Soldier Vehicle Assessment (SVA)																					SVA																			
Limited User Training (LUT)																									LUT															
(1) Milestone (MS) C																													MS C											
(2) MPF LRIP Option Award																																	MPF LRIP O							
MPF LRIP Delivery ((27)																																	MPF LRIP De							

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604645A / Armored Systems Modernization (ASM) - Eng Dev	Project (Number/Name) EV8 / Mobile Protected Firepower

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Alternative of Analysis (AoA) / Army Requirements Oversight Council (AROC)	3	2017	3	2017
Acquisition Strategy Panel (ASP)	3	2017	3	2017
AROC Capabilities Development Document (CDD)	3	2017	3	2017
Joint Requirements Oversight Council (JROC) CDD	1	2018	1	2018
Request for Proposal (RFP)	1	2018	2	2018
Risk Reduction of Large Caliber Weapon System	3	2017	2	2019
Source Selection Eval Board (SSEB) / Paper Proposals & Bid Samples	3	2018	1	2019
Mileston (MS) B	2	2019	2	2019
Contract Award (EMD)	2	2019	2	2019
MPF EMD	2	2019	4	2021
Large Caliber Weapon System Delivery	3	2019	3	2020
MPF Prototype Deliveries (20)	2	2020	2	2021
Production Prove-out Testing	4	2020	4	2021
Soldier Vehicle Assessment (SVA)	1	2021	4	2021
Limited User Training (LUT)	4	2021	4	2021
Milestone (MS) C	1	2022	1	2022
MPF LRIP Option Award	4	2022	4	2022
MPF LRIP Delivery ((27)	4	2022	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 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604710A / Night Vision Systems - Eng 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	-	65.482	84.519	108.504	-	108.504	105.417	75.722	54.465	45.704	Continuing	Continuing
EQ9: Close Access Target Reconnaissance (CATR)	-	0.262	1.173	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.435
L67: Soldier Night Vision Devices	-	19.710	26.257	32.504	-	32.504	23.355	19.649	19.343	19.200	Continuing	Continuing
L70: Night Vision Dev Ed	-	28.426	40.368	52.900	-	52.900	55.625	41.875	23.776	14.905	Continuing	Continuing
L75: Profiler	-	2.024	3.885	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.909
L76: Dismounted Fire Support Laser Targeting Systems	-	4.477	5.778	14.957	-	14.957	15.677	6.122	5.531	5.742	Continuing	Continuing
L79: Joint Effects Targeting Systems (JETS)	-	10.583	7.058	8.143	-	8.143	10.760	8.076	5.815	5.857	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element provides night vision/reconnaissance, surveillance and target acquisition technologies required for U. S. defense forces to engage enemy forces twenty-four hours a day under conditions of degraded visibility due to darkness, adverse weather, battlefield obscurants, foliage and man-made structures. These developments and improvements to high performance night vision electro-optics, radar, laser, and thermal systems and integration of related multi-sensor suites will enable near to long range target acquisition, identification and engagement to include significant fratricide reduction, which will improve battlefield command and control in "around-the-clock" combat operations.

Project EQ9 focuses on a kit of electronic devices that acquires, collects, and transmits data to provide near real time feedback in order to validate, follow, locate, or track a target (i.e., tagging, tracking, and locating (TTL)). Using electronic audio and/or video recorders, information obtained will validate movement and identify targets. In addition, threat monitoring can be integrated into existing operational tools, help to paint a clearer picture of the battlefield, pinpoint possible target locations, and identify and exploit enemy movements and patterns. CATR has been fielded since 2005 as a Quick Reaction Capability (QRC) program.

Project L67 develops, improves and miniaturizes high performance night vision electro-optics, thermal and laser systems. It also provides for systems integration of related multi-sensor suites to enable near to long-range target acquisition and engagement as well as improved battlefield command and control in around-the-clock combat operations. It focuses on adapting demonstrated technologies that bring improvements to the dismounted Soldiers' equipment. This project develops or enhances equipment that provides the individual Soldier's day/night situational awareness and individual targeting capability, sniper fire detection and location capability, and integrates improved target location and self-location capability to eliminate friendly fire incidents. Includes costs associated with efforts for integration and interface of products on Soldiers' head, body, and weapons.

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	
<p>Project L70 focuses on night vision, reconnaissance, surveillance and target acquisition (RSTA) sensor and suites of sensors to provide well-defined surveillance and targeting capabilities for a variety of Current, Modular, and Future Force platforms. This project includes: 3rd Generation Forward Looking Infra-Red (3GEN FLIR) B-Kit development activities, the 3GEN Long Range Advanced Scout Surveillance System (LRAS3) Modification Work Order (MWO) to integrate 3GEN FLIR B-Kit, and the Assistant Secretary of the Army for Acquisition, Logistics, and Technology ASA(ALT) Common Operating Environment (COE) effort to meet sensor interoperability requirements and improve the soldier-machine interface of the Program of Record (POR).</p> <p>Project L75 focuses on development of Profiler Block enhanced capabilities for meteorological (MET) measurement sensors and data. Improvements have reduced the footprint (less soldiers/vehicles) and complexity of the system, improved performance (accuracy), improved survivability, connectivity, no balloon sensor, multiple initialization data, and terrain visualization. The improved MET message data will increase lethality by enabling artillery a greater probability of first round hit with indirect fire systems. Profiler Block III provides a networked laptop configuration while further reducing the system's logistics footprint with the elimination of the High Mobility Multi-purpose Wheeled Vehicle (HMMWV) mounted shelter and trailer located in the Tactical Operations Center (TOC). The Profiler Virtual Module (PVM), a product improvement to the Block III, concept includes the following updates: update of weather model; update of software architecture removing legacy Block I code and creating a modular framework; development in conjunction with the Advanced Field Artillery Tactical Data System (AFATDS) program including AFATDS, to provide increased interoperability and usability; and to enable operation of the Profiler system in a virtual machine for use in the Common Operating Environment (COE) versions 2,3,4,and 5. This concept is a flexible approach that supports use of existing Block III hardware, increased accuracy during technical refresh of hardware with higher performance computers, and virtualization on the Command Post Computing Environment (CP CE) server.</p> <p>Project L76 matures technologies and capabilities which benefit the Lightweight Laser Designator Rangefinder (LLDR, AN/PED-1, AN/PED-1A, and AN/PED-1B) and the Joint Effects Targeting System (JETS). These precision targeting and next generation systems are used by dismounted Soldiers to locate, identify, and target enemy assets. This project focuses on reducing size, weight, power and cost, improving imaging performance, and increasing targeting accuracy. Targeting accuracy improvements will focus on developing and integrating affordable, non-magnetic, high accuracy, full-time (24/7), and all weather Precision Azimuth and Vertical Angle Measurement (PAVAM) devices, with reduced size, weight and power characteristics into the LLDR system. Long term goals include improving current celestial navigation systems to increase operational availability, developing precision targeting capabilities that will operate in a Global Positioning System (GPS) denied environment, and integration of Military Global Positioning System (GPS) User Equipment (M-Code) (next generation GPS) receivers into LLDR and JETS, when available.</p> <p>Project L79 focuses on the Joint Effects Targeting System (JETS). JETS is an Army program with joint interest (Air Force and Marine Corps). JETS will meet the one-man, hand-held precision targeting gap identified by the Fire Center of Excellence (FCOE). JETS is a light-weight, handheld system that will provide the single dismounted observer and Joint Terminal Attack Controller (JTAC) with a common, enhanced day and night thermal capability to rapidly acquire, accurately locate, positively identify, and precisely designate targets. JETS Target Location and Designation System (TLDS) will be able to interface with existing and future Service Forward Entry Systems (FESs). After initiating JETS TLDS production, this project will address continued development and integration of improved precision targeting components to reduce size, weight, power, and cost of the system, to address operation in environments where GPS is denied, and to integrate M-code GPS receivers when they become available.</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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng 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	67.582	84.519	88.129	-	88.129
Current President's Budget	65.482	84.519	108.504	-	108.504
Total Adjustments	-2.100	0.000	20.375	-	20.375
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.599	-			
• Adjustments to Budget Years	0.499	0.000	20.375	-	20.375

Change Summary Explanation

Fiscal Year 2018: Program increases of \$17.814 million to Project L67 for Soldier Night Vision Devices, \$8.826 million to L76 - Dismounted Fire Support Laser Targeting Systems, and \$0.304 million to L79 - Joint Effects Targeting Systems (JETS). Program decreases of -\$3.705 million to L75 Profiler and -\$2.864 million to L70 Night Vision Dev Ed. No change to EQ9 - CATR.

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

Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604710A / Night Vision Systems - Eng Dev				Project (Number/Name) EQ9 / Close Access Target Reconnaissance (CATR)			
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
EQ9: Close Access Target Reconnaissance (CATR)	-	0.262	1.173	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.435
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

CATR is a kit of electronic devices that acquires, collects, and transmits data to provide near real time feedback in order to validate, follow, locate, or track a target (.e., tagging, tracking, and locating (TTL)). Using electronic audio and/or video recorders, information obtained will validate movement and identify targets. In addition, threat monitoring can be integrated into existing operational tools, help to paint a clearer picture of the battlefield, pinpoint possible target locations, and identify and exploit enemy movements and patterns. CATR has been fielded since 2005 as a Quick Reaction Capability (QRC) program.

FY 2018 Base development dollars - There is no funding in FY 2018.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Close Access Target Reconnaissance (CATR) Post Milestone C/Fielding Decision	0.262	1.173	-	-	-
Description: Prepare for Post Milestone C/Fielding Decision and prepare acquisition documentation.					
FY 2016 Accomplishments: In order for CATR to obtain a Post Milestone C/Fielding Decision in FY2016, a Customer Test will be conducted by the Army Test & Evaluation Command (ATEC). Funding is also to secure the type classification of the CATR Basic Set, participate in the logistics demonstration, review Customer Test report, develop life cycle sustainment plan, and develop acquisition documents for a Post Milestone C/Fielding Decision.					
FY 2017 Plans: New technology will be evaluated and tested in order to support technology refresh in the Production & Deployment phase in FY2018.					
Accomplishments/Planned Programs Subtotals	0.262	1.173	-	-	-

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
• Close Access Target Reconnaissance: Close	5.012	7.970	8.050	-	8.050	5.210	5.554	5.310	5.340	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) EQ9 / <i>Close Access Target Reconnaissance (CATR)</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>
<i>Access Target Reconnaissance (CATR) (B10002)</i>											

Remarks

D. Acquisition Strategy

Based on a successful Materiel Development Decision (MDD) in September 2015, the Milestone Decision Authority designated the CATR program as a post-Milestone C Acquisition Category (ACAT) III program at the Production and Deployment phase. After a successful Fielding decision planned for 4th Quarter FY2016, CATR will utilize Quick Reaction Capability (QRC) equipment to refresh, re-kit existing, and field sets/systems in the Brigade Combat Teams (BCTs).

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 / 5					R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>				Project (Number/Name) L67 / <i>Soldier Night Vision Devices</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
L67: <i>Soldier Night Vision Devices</i>	-	19.710	26.257	32.504	-	32.504	23.355	19.649	19.343	19.200	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops, improves and miniaturizes high performance night vision electro-optics, thermal and laser systems. It also provides for systems integration of related multi-sensor suites to enable near to long-range target acquisition and engagement as well as improved battlefield command and control in around-the-clock combat operations. It focuses on adapting demonstrated technologies that bring improvements to the dismounted Soldiers' equipment. This project develops or enhances equipment that provides the individual Soldier's day/night situational awareness and individual targeting capability, sniper fire detection and location capability, and integrates improved target location and self-location capability to eliminate friendly fire incidents. 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 Weapons Sights (FWS)	19.610	26.257	24.057	-	24.057
<p>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 fire control under day/night obscurants, 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 smaller pixel focal plane arrays 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 aimpoint 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, resulting in a more accurate aimpoint 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 provide exceptional observation.</p>					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L67 / <i>Soldier Night Vision Devices</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 Government and Contractor testing of FWS-I Engineering and Manufacturing Development (EMD) systems in support of Milestone C, 4QFY16. Initiated FWS-CS and FWS-S EMD to design, build and deliver prototype systems for Government and Contractor testing. Improved the manufacturing process of uncooled Focal Plane Arrays (FPA) and micro-Organic Light-Emitting Diode (OLED) displays that are key components of FWS.</p> <p><i>FY 2017 Plans:</i> Continue FWS-CS and FWS-S EMD to design, build and deliver prototype systems for Government and Contractor testing. FWS-I continue testing. Improve the manufacturing process of uncooled Focal Plane Arrays (FPA) and micro-Organic Light-Emitting Diode (OLED) displays that are key components of FWS.</p> <p><i>FY 2018 Base Plans:</i> Continue FWS-CS and FWS-S EMD to design, build and deliver prototype systems for Government and Contractor testing. Complete FWS-CS and FWS-S EMD testing in preparation for Low Rate Initial Production (LRIP). Improve the manufacturing process of uncooled Focal Plane Arrays (FPA) and micro-Organic Light-Emitting Diode (OLED) displays that are key components of FWS</p>					
<p><i>Title:</i> Small Tactical Optical Rifle Mounted (STORM) II</p> <p><i>Description:</i> The AN/PSQ-23 STORM Micro-Laser Range Finder (MLRF) is a weapon-mounted multi-function laser system. It provides an eye safe laser range finder, digital compass, Infrared (IR) and visible aiming lights, and an IR illuminator for far target location with continuous range, accuracy, weight and power performance enhanced capabilities. Funding supports qualifying smaller, lighter, less expensive STORM variant (STORM II) with Soldiers.</p> <p><i>FY 2016 Accomplishments:</i> Conducted delta qualification testing for the STORM SLX variant.</p> <p><i>FY 2018 Base Plans:</i> Multiple contracts will be awarded to procure competing, updated STORM systems, STORM II. STORM II test systems will be capitalize on improved laser and electro-optical technologies to develop a lighter, lower cost, multi-function laser system for the individual Soldier. This effort incrementally funds the procurement and qualification of STORM II test systems for future procurements.</p>					
	0.100	-	4.850	-	4.850
<p><i>Title:</i> Family of Vision and Mobility Capabilities (FVMC)</p>					
	-	-	2.100	-	2.100

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L67 / <i>Soldier Night Vision Devices</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Description: 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> <p>FY 2018 Base Plans: Initiate development of system prototypes for the FVMC.</p>					
<p>Title: Pre-Shot Threat Detection</p> <p>Description: 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. 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, and verification of threat, while remaining undetected by enemy optics.</p> <p>FY 2018 Base Plans: Finalize production representative system and conduct Limited User Tests (LUT) for the Overt PTD prototypes. Draft and release RFP. Further develop covert capability.</p>	-	-	1.497	-	1.497
Accomplishments/Planned Programs Subtotals	19.710	26.257	32.504	-	32.504

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 Total Cost</u>
• 603774A VT7: 603774A - <i>Night Vision Systems</i> <i>Advanced Development (VT7)</i>	7.003	10.321	12.347	-	12.347	8.435	6.779	6.828	7.451	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 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L67 / <i>Soldier Night Vision Devices</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>
• Helmet Mounted Enhanced Vision Devi: <i>Helmet Mounted Enhanced Vision Devices (HMEVD) (SSN K36400)</i>	97.777	156.197	144.617	0.027	144.644	120.898	91.640	43.111	33.076	Continuing	Continuing
• Family of Weapons Sights - Inivid: <i>Family of Weapons 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
• Small Tactical Optical Rifle Mounte: <i>Small Tactical Optical Rifle Mounted (STORM) (SSN K35110)</i>	19.677	18.843	13.947	0.060	14.007	23.846	23.883	24.216	27.876	Continuing	Continuing
• Laser Target Locators: <i>Laser Target Locators (LTL) (SSN B53800)</i>	26.197	32.973	21.876	0.350	22.226	21.059	21.256	21.703	22.300	Continuing	Continuing
• Family of Weapons Sights- Crew Serv: <i>Family of Weapons Sights - Crew Serve (FWS-CS) (SSN K22003)</i>	-	-	1.033	-	1.033	31.469	78.822	86.403	95.575	Continuing	Continuing
• Family of Weapons Sights- Sniper: <i>Family of Weapons Sights - Sniper (FWS-S) (SSN K22004)</i>	-	-	8.185	-	8.185	15.753	26.467	16.555	1.728	Continuing	Continuing

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 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L67 / <i>Soldier Night Vision Devices</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 MGMT	MIPR	Various : Various	2.912	2.098	Feb 2016	3.087	Feb 2017	3.005	Feb 2018	-		3.005	Continuing	Continuing	0.000
Subtotal			2.912	2.098		3.087		3.005		-		3.005	-	-	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-Individual (FWS-I)	C/CPFF	DRS RSTA, Inc BAE Systems : Dallas, TX/Nashua, NH	33.396	3.043	Jun 2016	-		-		-		-	0.000	36.439	0.000
Family of Weapon Sights-Crew Served (FWS-CS)	C/CPFF	Various : Various	0.000	6.459	Sep 2016	14.465	Jan 2017	14.499	Dec 2017	-		14.499	0.000	35.423	0.000
Family of Weapon Sights-Sniper (FWS-S)	Allot	N2 Imaging Systems : Irvine, CA	0.000	4.600	Jun 2016	4.122	Jan 2017	0.607	Dec 2017	-		0.607	0.000	9.329	0.000
Family of Vision and Mobility Capabilities (FVMC)	MIPR	NVESD : Ft Belvoir, VA	0.000	-		-		2.100	Feb 2018	-		2.100	0.000	2.100	Continuing
Pre-Shot Threat Detection	Various	Various : Various	0.000	-		-		0.847	Feb 2018	-		0.847	0.000	0.847	Continuing
STORM II Test Systems (Vendor A)	C/FFP	TBD : TBD	0.000	-		-		2.125	Jan 2018	-		2.125	0.000	2.125	Continuing
STORM II Test Systems (Vendor B)	C/FFP	TBD : TBD	0.000	-		-		2.125	Jan 2018	-		2.125	0.000	2.125	Continuing
Subtotal			33.396	14.102		18.587		22.303		-		22.303	0.000	88.388	-

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	4.195	1.046	Feb 2016	1.549	Feb 2017	2.429	Feb 2018	-		2.429	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 / 5				PE 0604710A / Night Vision Systems - Eng Dev					L67 / Soldier Night Vision Devices						
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			4.195	1.046		1.549		2.429		-		2.429	-	-	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			
Government Test Support Activity	MIPR	Army Test and Evaluation Command : Various	44.695	2.464	Mar 2016	3.034	Jun 2017	4.767	Jul 2018	-		4.767	Continuing	Continuing	0.000
Subtotal			44.695	2.464		3.034		4.767		-		4.767	-	-	0.000
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			85.198	19.710	26.257	32.504	-	32.504	-	-	-				
Remarks															

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L67 / <i>Soldier Night Vision Devices</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) FWS-I MS C				▲ MS C																								
(2) FWS-CREW SERVED (CS) MS B			▲ MS B																									
FWS-CS Engineering and Manufacturing Development			■ EMD																									
(3) FWS-CS MS C												▲ MS C																
(4) FWS-SNIPER (S) MS B			▲ MS B																									
FWS-S Engineering and Manufacturing Development			■ EMD																									
(5) FWS-S MS C											▲ MS C																	
Family of Vision and Mobility Capabilities (FVMC)											■ Development																	
(6) LTLM II Contract Award			▲ Contract Award																									
LTLM II Development and Operational Testing											■																	
STORM SLX Delta Qualification Testing				■																								
(7) STORM II Production Contract Award											▲ Contract Award																	
STORM II Developmental and Operational Testing												■																

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L67 / <i>Soldier Night Vision Devices</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) PTD MS A	<div style="position: relative; height: 100px;"> ▲ MS A </div>																																																			
PTD Overt Technology Development																																																				
PTD Limited User Testing (LUT)																																																				
(2) PTD MS C																	<div style="position: relative; height: 100px;"> ▲ MS C </div>																																			

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L67 / <i>Soldier Night Vision Devices</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FWS-I MS C	4	2016	4	2016
FWS-CREW SERVED (CS) MS B	3	2016	3	2016
FWS-CS Engineering and Manufacturing Development	3	2016	4	2018
FWS-CS MS C	4	2018	4	2018
FWS-SNIPER (S) MS B	3	2016	3	2016
FWS-S Engineering and Manufacturing Development	3	2016	2	2018
FWS-S MS C	2	2018	2	2018
Family of Vision and Mobility Capabilities (FVMC)	1	2018	4	2022
LTLM II Contract Award	4	2016	4	2016
LTLM II Development and Operational Testing	4	2017	1	2018
STORM SLX Delta Qualification Testing	4	2016	3	2017
STORM II Production Contract Award	2	2018	2	2018
STORM II Developmental and Operational Testing	4	2018	3	2019
PTD MS A	2	2016	2	2016
PTD Overt Technology Development	4	2016	3	2018
PTD Limited User Testing (LUT)	2	2018	1	2019
PTD MS C	1	2020	1	2020

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>				Project (Number/Name) L70 / <i>Night Vision Dev Ed</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
L70: <i>Night Vision Dev Ed</i>	-	28.426	40.368	52.900	-	52.900	55.625	41.875	23.776	14.905	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project performs Engineering and Manufacturing Development (EMD) on high performance night vision, Reconnaissance, Surveillance, and Target Acquisition (RSTA) systems and other related systems that allow forces to locate and track enemy units in day, night, and all battlefield conditions, and through natural and man-made structures and obscurants. It also develops and integrates suites of these sensors to provide well-defined surveillance and targeting capabilities, as well as architectures for these sensors to communicate automatically. These efforts focus on meeting the requisite night vision and RSTA capabilities required for evolving Current Force, Modular Force, and Future Force systems.

The project supports the 3rd Generation Forward Looking Infrared (3GEN FLIR) B-Kit EMD program, which incorporates the next generation of forward looking infrared technologies. The 3GEN FLIR EMD program will leverage critical technology development from the Advanced Thermal Imaging EMD and Combat Vehicle Advanced Sensor Technology (CVAAT) effort to develop a common 3GEN FLIR B-Kit for integration into US Army FLIR sensor systems in accordance with the approved Improved Forward Looking Infrared (I-FLIR) Capability Development Document (CDD). The common 3GEN FLIR B-Kit prescribed by the I-FLIR CDD will allow the Army to achieve economies of scale and avoid duplicative engineering and development costs. As a result, 3GEN FLIR capabilities can be delivered at a lower cost to the Abrams, Bradley, and Long Range Advanced Scout Surveillance System (LRAS3), while potentially leveraging 3GEN FLIR components for airborne applications. The 3GEN FLIR B-Kit provides Mid Wave Infrared and Long Wave Infrared digital video and the electronic interfaces required to integrate the 3GEN FLIR technology with the host platform sensor. When integrated in current sensor packages, 3GEN FLIR technology enhances the war-fighters' survivability and lethality through increased identification range performance, while enabling the detection of difficult or obscured targets and faster threat detection through automated processes. The 3GEN FLIR B-Kit EMD program is also a key element in maintaining the Army's FLIR industrial base.

The project supports LRAS3 Modification Work Order (MWO) to integrate 3GEN FLIR B-Kit. The LRAS3 MWO effort includes integration of 3GEN FLIR B-Kit technology, an Inertial Measurement Unit (IMU), and an M-code Global Positioning System (GPS) receiver. Collectively, these capabilities will improve the Far Target Location (FTL) accuracy of the LRAS3 and enhance the scout's survivability and lethality through increased detection, recognition and identification range performance.

This project also executes the Army Sensor Computing Environment (CE) effort which is part of the Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA-ALT) Common Operating Environment (COE) program. The Sensor CE effort focuses on increasing sensor interoperability across the enterprise and improving the Soldier-machine interface. This is done by defining, demonstrating and standardizing Sensor interfaces across the Army networks. Standardized interfaces delivered from this effort will be incorporated into current and future sensor systems and programs.

FY 2018 Base Funding in the amount of \$52.900 million supports the 3GEN FLIR B-Kit EMD program activities as well as the initiation of the 3GEN LRAS3 Modification Work Order (MWO) effort to integrate 3GEN FLIR B-Kit, an IMU, and an M-code GPS receiver; and completion of the performance specification and solicitation

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L70 / <i>Night Vision Dev Ed</i>
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documentation. Additionally, FY 2018 Base Funding supports the continued activities associated with meeting sensor interoperability requirements and improving the Soldier-machine interface in support of the Army's vision of the Common Operating Environment (COE).

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Title: 3GEN FLIR B-Kit Milestone Activities</p> <p>Description: 3GEN FLIR engineering and document preparation.</p> <p>FY 2016 Accomplishments: FY 2016 Base Funding supports EMD engineering and logistics document preparation in support of a 2QFY16 Milestone B decision. Support includes preparation of core logistics analysis, system engineering plan, test and evaluation master plan, life cycle sustainment plan, and an independant logistics assessment.</p>	4.755	-	-	-	-
<p>Title: 3GEN FLIR B-Kit EMD</p> <p>Description: 3GEN FLIR EMD requirements and contract awards.</p> <p>FY 2016 Accomplishments: FY 2016 Base Funding supports source selection activities, award of multiple contracts in support of 3GEN FLIR, and program management support. Contract awards will support development engineering activities and Preliminary Design Review (PDR).</p> <p>FY 2017 Plans: FY 2017 Base Funding supports the continuation of 3GEN FLIR development activities to include Critical Design Review (CDR), coding of software, the initiation of prototype manufacturing, platform Preliminary Design Review (PDR) support activities, and program management support.</p> <p>FY 2018 Base Plans: FY 2018 Base Funding supports the continuation of 3GEN FLIR Prototype Fabrication, Test Readiness Review (TRR) preparation, initiation of software Formal Qualification Testing (FQT), and program management support.</p>	17.191	37.212	43.919	-	43.919
<p>Title: Common Operating Environment (COE)</p> <p>Description: This effort supports the Common Operating Environment vision by improving the sensor interoperability requirement and the Soldier-machine interface. Resultant improvements to be made on a program by program basis.</p> <p>FY 2016 Accomplishments:</p>	5.981	0.100	0.100	-	0.100

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L70 / <i>Night Vision Dev Ed</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>FY 2016 Base Funding supports continued development of the COE program to include meeting the network interoperability requirement and improving the soldier-machine interface. Specific FY16 activities include continuation of configuration management, specification development & implementation, and execution of demonstrations and experimentation for transition into Army programs.</p> <p>FY 2017 Plans: FY 2017 Base Funding supports continued development of the COE program to include meeting the sensor interoperability requirement and improving the soldier-machine interface. Specific FY17 activities include continued execution of demonstrations and experimentation for transition into Army programs.</p> <p>FY 2018 Base Plans: FY 2018 Base Funding supports continued development of the COE program to include meeting the sensor interoperability requirement and improving the soldier-machine interface. Specific FY18 activities include continued demonstrations and experimentation for transition into Army programs.</p>					
<p>Title: 3GEN LRAS3 ECP to integrate 3GEN FLIR B-Kit</p> <p>Description: This effort supports the sensor enhancement activities required to integrate 3GEN FLIR B-Kit technology into the LRAS3.</p> <p>FY 2016 Accomplishments: FY 2016 Base Funding supports performing trade studies to analyze the current LRAS3 for modification required to integrate 3GEN FLIR B-Kit.</p> <p>FY 2017 Plans: FY 2017 Base Funding supports performing trade studies to analyze the current LRAS3 for modification required to integrate 3GEN FLIR B-Kit, an Inertial Measurement Unit (IMU), and an M-code GPS receiver; and developing the performance specification and preparing solicitation documentation.</p> <p>FY 2018 Base Plans: FY 2018 Base Funding supports completion of the performance specification and solicitation documentation; and initiation of the Modification Work Order (MWO) to integrate 3GEN FLIR B-Kit, an IMU, and an M-code GPS receiver.</p>	0.499	3.056	8.881	-	8.881
Accomplishments/Planned Programs Subtotals	28.426	40.368	52.900	-	52.900

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L70 / <i>Night Vision Dev Ed</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>
• ABRAMS Tank Improvement Program: <i>Abrams Tank Improvement Program (PE 0203735A)</i>	73.768	88.452	108.570	-	108.570	159.380	108.000	68.000	59.939	Continuing	Continuing
• BRADLEY Improvement Program: <i>Bradley Improvement Program (PE 0203735A)</i>	91.752	102.382	130.863	-	130.863	179.400	149.000	87.500	81.889	Continuing	Continuing
• LRAS3: <i>Long Range Advanced Scout Surveillance System (LRAS3) (K38300) OPA2</i>	-	-	-	-	-	-	-	3.000	50.000	Continuing	Continuing

Remarks

D. Acquisition Strategy

3GEN FLIR: Materiel Development Decision (MDD) was received from the Army Acquisition Executive (AAE) and the Acquisition Decision Memorandum (ADM) was signed on 22-Dec-2014. Per the ADM, 3GEN FLIR entered the acquisition lifecycle at Milestone B (MS B) in 2Q FY 2016. After a successful MS B decision, competitive EMD contracts were awarded to design, develop, integrate and test the 3GEN FLIR B-Kit prior to production and mitigate the industrial base risk. The host platforms are responsible for integration of the 3GEN FLIR B-Kit.

3GEN Long Range Advanced Scout Surveillance System (LRAS3): After a Milestone Decision Authority (MDA) review planned for 2Q FY2017, 3GEN LRAS3 will perform technical trade studies to determine modifications required to the current LRAS3 to integrate 3GEN FLIR B-Kit technology, an Inertial Measurement Unit (IMU), and an M-coded Global Positioning System (GPS) receiver. Contract preparation activities are planned for the Modification Work Order (MWO) award in 3Q FY 2018.

Sensor CE: Additional Fiscal Year 2018 activities include continued development of the sensor interoperability requirement and improving the Soldier-machine interface in support of the Army's vision of the Common Operating Environment (COE).

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 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L70 / <i>Night Vision Dev Ed</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			
Project Management	MIPR	PM TS : Ft. Belvoir, VA	11.244	1.870	Feb 2016	1.332	Jan 2017	3.006	Jan 2018	-		3.006	0.000	17.452	9.454
Subtotal			11.244	1.870		1.332		3.006		-		3.006	0.000	17.452	9.454

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			
FY 2012-FY 2013: Develop, Fab, and Qual of a common Ground Platform Engine with Block II EOCCM	C/Various	Various : Various	0.049	-		-		-		-		-	0.000	0.049	0.000
3GEN FLIR B-Kit Engineering/Document Prep	C/Various	Various : Various	19.495	2.190	Jan 2016	-		-		-		-	0.000	21.685	0.000
3GEN FLIR B-Kit EMD	C/CPIF	Various : Various	0.000	17.191	Mar 2016	34.150	Dec 2016	40.030	Dec 2017	-		40.030	0.000	91.371	0.000
3GEN LRAS3: Tech Trade Studies	C/TBD	Various : Various	0.000	0.499	Aug 2016	2.182	Mar 2017	-		-		-	0.000	2.681	0.000
3GEN LRAS3: ECP Integration	C/TBD	Various : Various	0.000	-		-		7.486	Apr 2018	-		7.486	0.000	7.486	0.000
PSS P3I: CE COE	C/FP	Various : Various	14.292	4.870	Mar 2016	-		-		-		-	0.000	19.162	0.000
Subtotal			33.836	24.750		36.332		47.516		-		47.516	0.000	142.434	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			
3GEN FLIR B-Kit Support	C/TBD	Various : Various	28.777	1.606	Mar 2016	1.930	Feb 2017	1.154	Feb 2018	-		1.154	0.000	33.467	0.000
3GEN LRAS3 - Spec development and solicitation prep	C/TBD	Various : Various	0.000	-		0.674	Feb 2017	1.124	Feb 2018	-		1.124	0.000	1.798	0.000

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L70 / <i>Night Vision Dev Ed</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
3GEN FLIR - Spec Development, Trade Studies, Analyses, & Milestones																												
(1) 3GEN FLIR B-Kit MS B																												
3GEN FLIR B-Kit Development, Test, and Integration																												
3GEN LRAS3 ECP to Integrate 3GEN FLIR B-Kit: Perform Tech Trade Studies																												
3GEN LRAS3 ECP to Integrate 3GEN FLIR B-Kit: Spec Development & Integration																												
3GEN LRAS3 ECP to Integrate 3GEN FLIR B-Kit: ECP Development, Test, and Integration																												
Common Operating Environment, Development																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L70 / <i>Night Vision Dev Ed</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
3GEN FLIR - Spec Development, Trade Studies, Analyses, & Milestone Prep	1	2012	2	2016
3GEN FLIR B-Kit MS B	2	2016	2	2016
3GEN FLIR B-Kit Development, Test, and Integration	2	2016	4	2022
3GEN LRAS3 ECP to Integrate 3GEN FLIR B-Kit: Perform Tech Trade Studies	2	2017	4	2017
3GEN LRAS3 ECP to Integrate 3GEN FLIR B-Kit: Spec Development & Solicitation	2	2017	2	2018
3GEN LRAS3 ECP to Integrate 3GEN FLIR B-Kit: ECP Development, Test & Integration	2	2018	4	2022
Common Operating Environment, Development	2	2012	4	2018

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>				Project (Number/Name) L75 / <i>Profiler</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
L75: <i>Profiler</i>	-	2.024	3.885	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.909
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Profiler Virtual Module (PVM) provides meteorological (MET) data that includes wind speed, wind direction, temperature, barometric pressure, and humidity information required for use in the Advanced Field Artillery Tactical Data System (AFATDS). The correctional information is necessary for precise targeting and terminal guidance to Field Artillery assets. PVM improves accuracy of predictive fires solutions and allows for first round effects on target and reduces the risk of fratricide. This capability increases the lethality of indirect fire systems such as the rocket launchers, self-propelled or towed howitzers, and mortars.

FY2018 Base funding is \$0.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Profiler Virtual Module COE V2/3 development	1.158	2.635	-	-	-
Description: Implementation of COE V2/3 requirements and Digital Terrain and Elevation Data (DTED) upgrades and improved elevation algorithms.					
FY 2016 Accomplishments: Completed COE V2 requirements and Digital Terrain and Elevation Data (DTED) upgrades and improved elevation algorithms.					
FY 2017 Plans: Continue development for PVM in compliance with CP CE/COE V3					
Title: Support cost for conversion of the MET model for Profiler Virtual Module	0.566	0.650	-	-	-
Description: Conversion of the MET model for Profiler Virtual Module					
FY 2016 Accomplishments: Continued Engineering and development of PVM to receive the European weather data and compute meteorological data for Advanced Field Artillery Tactical Data System (AFATDS).					
FY 2017 Plans: Continued engineering and development of PVM for MET model upgrades.					
Title: Formal Qualification Testing/Developmental Testing (FQT/DT)	-	0.300	-	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L75 / <i>Profiler</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Description: Conduct and complete FQT/DT					
FY 2017 Plans: Conduct Developmental Testing for PVM 1.0.1 for CP CE/COE V3					
Title: Program Support Costs for Profiler software development	0.300	0.300	-	-	-
Description: Cost for Project Management Office efforts.					
FY 2016 Accomplishments: Program Management Office (PMO) efforts.					
FY 2017 Plans: Provide Program Management Office (PMO) efforts.					
Accomplishments/Planned Programs Subtotals	2.024	3.885	-	-	-

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
• Profiler (K27900): <i>Profiler (K27900)</i>	4.057	-	-	-	-	-	-	-	-	0.000	4.057

Remarks

D. Acquisition Strategy
The Profiler Acquisition Strategy was approved by the MDA on 28 March 2012 for a product improvement to the Profiler Block III for a Virtual Module supporting the Command Post Computing Environment of the Common Operating Environment (COE). PVM 1.0 was completed in FY15. PVM 1.0.1 reflects continued updates for weather model changes and to meet directed COE compliance.

The Profiler product was transitioned to PEO C3T per the transition plan signed by the Army Acquisition Executive (AAE) dated 14 May 2015. The APB dated 30 Sep 2010, reflecting efforts to develop Profiler Block 3, was closed out 3 Apr 2015. Profiler will transition to sustainment in FY17/18.

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 / 5					R-1 Program Element (Number/Name) PE 0604710A / Night Vision Systems - Eng Dev				Project (Number/Name) L76 / Dismounted Fire Support Laser Targeting Systems			
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
L76: Dismounted Fire Support Laser Targeting Systems	-	4.477	5.778	14.957	-	14.957	15.677	6.122	5.531	5.742	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project matures technologies and capabilities which benefit the Lightweight Laser Designator Rangefinder (LLDR, AN/PED-1, AN/PED-1A, and AN/PED-1B) and the Joint Effects Targeting System (JETS). These precision targeting and next generation systems are used by dismounted Soldiers to locate, identify, and target enemy assets. This project focuses on reducing size, weight, power and cost, improving imaging performance, and increasing targeting accuracy. Targeting accuracy improvements will focus on developing and integrating affordable, non-magnetic, high accuracy, full-time (24/7), and all weather Precision Azimuth and Vertical Angle Measurement (PAVAM) devices, with reduced size, weight, and power characteristics into the LLDR system. Long term goals include improving current celestial navigation systems to increase operational availability, developing precision targeting capabilities that will operate in a Global Positioning System (GPS) denied environment to improve situational awareness, and to integrate Military Global Positioning System (GPS) User Equipment (M-Code) (next-generation GPS) receivers into LLDR and JETS, when available.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Precision Azimuth and Vertical Angle Measurement (PAVAM) development	4.477	4.900	-	-	-
Description: PAVAM is a non-magnetic based inertial navigation materiel solution for targeting devices in order to provide 24/7 precision target capability. This PAVAM effort improves azimuth accuracy leading to reduced collateral damage and improved target engagement. Celestial navigation systems provide a supplemental high accuracy, low cost azimuth measurement capability.					
FY 2016 Accomplishments: Continued funding the development of an improved PAVAM and initiated integration with the LLDR to provide a 24/7 precision targeting capability.					
FY 2017 Plans: Base FY 2017 Description: Complete integration of an improved precision AVAM with the LLDR system and conduct testing. Continue development of improved celestial navigation system technologies for application to LLDR and JETS.					
Title: Laser Development	-	0.500	-	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L76 / <i>Dismounted Fire Support Laser Targeting Systems</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Description: Development of lightweight, low cost, multi-spectral, and more efficient lasers, and to develop laser stabilization technologies.</p> <p>FY 2017 Plans: Incorporate laser improvements into the LLDR and conduct testing.</p>					
<p>Title: Target Acquisition Development</p> <p>Description: Focuses on development of improvements to optical detection, recognition, and identification of targets for precision targeting systems.</p> <p>FY 2017 Plans: Incorporate imaging improvements into the LLDR design and conduct testing.</p>	-	0.378	-	-	-
<p>Title: Integration of M-Code GPS Receivers</p> <p>Description: Integrates M-Code GPS Receivers into the LLDR System.</p> <p>FY 2018 Base Plans: Initiate integration of M-Code GPS receivers into LLDR.</p>	-	-	0.838	-	0.838
<p>Title: Design, Integration, & Qualification of Improved LLDR Systems</p> <p>Description: One contract will be competitively awarded to procure updated LLDR systems with improved imaging performance and 24/7 precision targeting capability. This effort procures and qualifies improved LLDR systems for production beginning in FY20.</p> <p>FY 2018 Base Plans: Initiate procurement of competing, improved LLDR systems.</p>	-	-	14.119	-	14.119
Accomplishments/Planned Programs Subtotals	4.477	5.778	14.957	-	14.957

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>
• LLDR Mod-of-In-Service (SSN KA3100): <i>Lightweight</i>	22.314	28.058	5.198	3.974	9.172	29.247	46.212	40.271	65.307	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 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L76 / <i>Dismounted Fire Support Laser Targeting Systems</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>
<i>Laser Designator Rangefinder (LLDR) Modification-of-In-Service (SSN KA3100)</i>											
• <i>JETS (SSN K32101): Joint Effects Targeting System (JETS) (SSN K32101)</i>	47.212	50.726	48.664	-	48.664	43.511	77.755	95.736	92.853	Continuing	Continuing
• <i>JETS (654710.L79-RDTE): Joint Effects Targeting System (JETS) (654710.L79-RDTE)</i>	10.583	7.058	8.143	-	8.143	10.760	8.076	5.815	5.857	Continuing	Continuing

Remarks

D. Acquisition Strategy

This project continues to exercise competitively awarded contracts using value adjusted total evaluated price (VATEP) 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 / 5				PE 0604710A / Night Vision Systems - Eng Dev				L76 / Dismounted Fire Support Laser Targeting Systems							
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-SSL : Ft. Belvoir VA 22060	0.007	0.050	Mar 2016	0.050	Nov 2016	0.075	Nov 2017	-		0.075	Continuing	Continuing	Continuing
Subtotal			0.007	0.050		0.050		0.075		-		0.075	-	-	-
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
PAVAM Development and Integration	SS/CPFF	Northrop Grumman : Apopka, FL	4.188	3.140	Aug 2016	3.720	Nov 2016	-		-		-	0.000	11.048	0.000
Laser Development	SS/CPFF	TBD : Alexandria, VA 22310	0.680	0.500	Apr 2016	0.500	Feb 2017	-		-		-	Continuing	Continuing	0.000
Target Acquisition Development	SS/CPFF	CACI Technologies, INC : Chantilly, VA 20151	0.100	-		0.378	Nov 2016	-		-		-	Continuing	Continuing	0.000
M-Code Integration	SS/CPFF	Johns Hopkins University : Laurel, MD	0.000	-		-		0.657	Dec 2017	-		0.657	Continuing	Continuing	0.000
LLDR Qualification	C/FFP	TBD : TBD	0.000	-		-		13.625	Mar 2018	-		13.625	Continuing	Continuing	0.000
Subtotal			4.968	3.640		4.598		14.282		-		14.282	-	-	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
Matrix Support	MIPR	Various : Various	0.000	-		0.180	Nov 2016	-		-		-	Continuing	Continuing	0.000
Science and Engineering Support	SS/CPFF	Johns Hopkins University : Laurel, MD	0.000	0.787	May 2016	0.600	Jan 2017	0.600	Dec 2017	-		0.600	Continuing	Continuing	0.000
Subtotal			0.000	0.787		0.780		0.600		-		0.600	-	-	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 / 5				PE 0604710A / Night Vision Systems - Eng Dev				L76 / Dismounted Fire Support Laser Targeting Systems							
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 and Evaluation Support	MIPR	Army Test and Evaluation Command, WSMR, NM : MIPR	0.000	-		0.350	Mar 2017	-		-		-	Continuing	Continuing	Continuing
Subtotal			0.000	-		0.350		-		-		-	-	-	-
			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			4.975	4.477		5.778		14.957		-		14.957	-	-	-
Remarks															

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L76 / <i>Dismounted Fire Support Laser Targeting 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
Azimuth and Vertical Angle Measurement (PAVAM) Development and In																												
Improved LLDR Systems																												
Build Improved LLDR Systems for Testing																												
Contractor Testing of Improved LLDR Systems																												
Government Testing of Improved LLDR Systems																												
Improved Laser Development and Laser Stabilization																												
(1) LLDR Laser Stabilization cut-in																												
Improved Target Acquisition Development																												
M-Code Integration Development (LLDR)																												
(2) M-Code Cut-in																												
Future Dismounted Fire Support Sensor Development																												
(3) Production Award																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L76 / <i>Dismounted Fire Support Laser Targeting Systems</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Azimuth and Vertical Angle Measurement (PAVAM) Development and Integration	2	2014	4	2022
Improved LLDR Systems	2	2018	2	2023
Build Improved LLDR Systems for Testing	2	2018	1	2020
Contractor Testing of Improved LLDR Systems	2	2019	3	2020
Government Testing of Improved LLDR Systems	3	2020	2	2021
Improved Laser Development and Laser Stabilization	2	2014	4	2022
LLDR Laser Stabilization cut-in	2	2020	2	2020
Improved Target Acquisition Development	1	2015	4	2017
M-Code Integration Development (LLDR)	2	2017	2	2021
M-Code Cut-in	3	2021	3	2021
Future Dismounted Fire Support Sensor Development	3	2020	4	2023
Production Award	3	2020	3	2020

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604710A / Night Vision Systems - Eng Dev				Project (Number/Name) L79 / Joint Effects Targeting Systems (JETS)			
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
L79: Joint Effects Targeting Systems (JETS)	-	10.583	7.058	8.143	-	8.143	10.760	8.076	5.815	5.857	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Effects Targeting System (JETS) is an Army program with joint interest (Air Force and Marine Corps). JETS will meet the one-man, hand-held precision targeting gap identified by the Fire Center of Excellence (FCOE). JETS is a light-weight, handheld system that will provide the single dismounted observer and Joint Terminal Attack Controller (JTAC) with a common, enhanced day and night thermal capability to rapidly acquire, accurately locate, positively identify, and precisely designate targets. JETS Target Location and Designation System (TLDS) will be able to interface with existing and future Forward Entry Systems (FESs). After initiating JETS TLDS production, this project will address continued development and integration of improved precision targeting components to reduce size, weight, power, and cost of the system, to improve situational awareness, to address operation in environments where Global Positioning System (GPS) is denied, and to integrate Military GPS User Equipment (M-Code) GPS receivers when they become available.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Joint Effects Targeting System (JETS) Engineering and Manufacturing Development (EMD)	10.583	2.162	-	-	-
Description: JETS is a lightweight mission equipment set for the dismounted forward observers and Joint Terminal Attack Controllers (JTAC). JETS provides observers and controllers the means to call for fire and control delivery of air, ground and naval surface fire support, including using precision munitions and effects (both lethal and non-lethal).					
FY 2016 Accomplishments: Completed EMD phase with two prime contract vendors by completing contractor testing and Government Developmental Testing (DT).					
FY 2017 Plans: Refurbish EMD prototypes with corrective actions following DT(with one contractor). Perform follow-on DT and limited user testing.					
Title: Joint Effects Targeting System (JETS) Low-Rate Initial Production Qualification Testing	-	-	1.730	-	1.730
Description: This projects supports the Initial Operational Test & Evaluations (IOT&E) for the JETS production representative test systems.					

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604710A / <i>Night Vision Systems - Eng Dev</i>	Project (Number/Name) L79 / <i>Joint Effects Targeting Systems (JETS)</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
FY 2018 Base Plans: Conduct IOT&E.					
Title: Precision Azimuth and Vertical Angle Measurement (PAVAM) Development Description: Focuses on developments to improve size, weight, power and cost for inertial navigation PAVAM solutions which provide a 24/7 precision targeting capability. Develops improvements to celestial navigation PAVAM solutions to improve availability of precision measurements over a wider range of environments.	-	4.896	6.413	-	6.413
FY 2017 Plans: Continue development of the improved AVAM to reduce size, weight, power and cost, and initiate development to address operation in GPS denied environments.					
FY 2018 Base Plans: Continue development to address operation in GPS challenged/denied environments.					
Accomplishments/Planned Programs Subtotals	10.583	7.058	8.143	-	8.143

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>
• Joint Effects Targeting System: <i>Joint Effects Targeting System (SSN K32101)</i>	47.212	50.726	48.664	-	48.664	43.511	77.755	95.736	92.853	Continuing	Continuing
• Dismounted Fire Spt Laser Targeting: <i>Dismounted Fire Support Laser Targeting Sys (654710.L76)</i>	4.477	5.778	14.957	-	14.957	15.677	6.122	5.531	5.742	Continuing	Continuing

Remarks

D. Acquisition Strategy
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-2, RDT&E Budget Item Justification: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604713A / Combat Feeding, Clothing, and Equipment
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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	-	1.694	2.054	3.702	-	3.702	4.141	5.993	4.693	3.737	Continuing	Continuing
548: Mil Subsistence Sys	-	1.374	0.759	0.700	-	0.700	0.962	1.786	1.828	1.705	Continuing	Continuing
EL2: Army Field Feeding Equipment	-	0.320	1.295	3.002	-	3.002	3.179	4.207	2.865	2.032	Continuing	Continuing

A. Mission Description and Budget Item Justification

This project supports the development and demonstration and Non-Developmental Item (NDI) Commercial Off The Shelf (COTS) evaluation of combat feeding equipment to enhance soldier efficiency and survivability, and to reduce food service logistics requirements for all four services. The project supports multi-fuel, rapidly deployable field food service equipment initiatives and engineering and manufacturing development to improve equipment, enhance safety in food service, and decrease fuel and water requirements. This project develops critical enablers that support the Joint Future Capabilities and Joint Expeditionary mindset, by maintaining readiness through fielding and integrating new equipment; by enhancing the field soldier's well-being; and providing soldier usable equipment. They also reduce sustainment requirements, related Combat Support/Combat Service Support (CS/CSS) demands on lift, the combat zone footprint, and costs for logistical support.

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

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	1.763	2.054	2.225	-	2.225
Current President's Budget	1.694	2.054	3.702	-	3.702
Total Adjustments	-0.069	0.000	1.477	-	1.477
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.069	-			
• Adjustments to Budget Years	0.000	0.000	1.477	-	1.477

Change Summary Explanation

The FY 2018 funding request of \$1.135 million was increased to fully fund a critical RDT&E requirement on the Battlefield Kitchen (BK) program. Funding was required to maintain an accelerated developmental effort focused on getting the BK into production in FY 2019 (Project EL2). The remainder of the FY 2018 increase (project 548) is due to an RDTE Civilian Pay raise.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604713A / <i>Combat Feeding, Clothing, and Equipment</i>				Project (Number/Name) 548 / <i>Mil Subsistence Sys</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
548: <i>Mil Subsistence Sys</i>	-	1.374	0.759	0.700	-	0.700	0.962	1.786	1.828	1.705	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the development and demonstration and Non-Developmental Item (NDI) Commercial Off The Shelf (COTS) evaluation of combat feeding equipment to enhance Soldier efficiency and survivability, and to reduce food service logistics requirements for all four services. The project supports multi-fuel, rapidly deployable field food service equipment initiatives and engineering and manufacturing development to improve equipment, enhance safety in food service, and decrease fuel and water requirements. This project develops critical enablers that support the Joint Future Capabilities and Joint Expeditionary mindset, by maintaining readiness through fielding and integrating new equipment; by enhancing the field Soldier's well-being; and providing Soldier usable equipment. They also reduce sustainment requirements, related Combat Support/Combat Service Support (CS/CSS) demands on lift, the 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
Title: Fielded Individual Ration Improvement Project (FIRIP)	0.277	0.130	0.075
Description: Continuous product improvement project for the Meal Ready to Eat (MRE). Integrate prototype components/ technologies into the MRE menu systems to improve operational effectiveness. Demonstrate system integration and producibility, develop component specifications and transition to Defense Logistics Agency – Troop Support (DLA-Troop Support) for procurement.			
FY 2016 Accomplishments: Finalized MRE procurement documents and standards for verification for MRE (2018 date of pack) and initiated transition to DLA-Troop Support based on Budget Activity 4 (BA4) Joint Service approvals. Obtained Surgeon General approval of revised MRE menus. Executed production testing with industry to ensure consistent ration quality, understand PCR requirements, resolve vendor/supplier issues, and conducted confirmatory sensory, chemical, physical and shelf life testing.			
FY 2017 Plans: Integrate prototype components/technologies into MRE menu system to improve quality, acceptability, nutrition and expand variety. Will plan and complete field testing of new ration menus for MRE (2020 date of pack) in an operationally relevant environment.			
FY 2018 Plans: Based on field test results, will present recommendations to Joint Services (2Q18) for continued product improvement of ration components/packaging/technologies for MRE (2020 date of pack). Will finalize MRE procurement documents and initiate transition			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604713A / <i>Combat Feeding, Clothing, and Equipment</i>	Project (Number/Name) 548 / <i>Mil Subsistence Sys</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
to DLA-Troop Support. Will obtain Surgeon General approval of revised MRE menus. Will execute production testing with industry to ensure consistent ration quality, understand Performance Contract Requirements (PCR), and resolve vendor/supplier issues. Will obtain selected new items for field test. Will conduct field evaluation of new candidate ration components for MRE (2021 date of pack) to improve quality, acceptability, nutrition and expand variety.				
<p>Title: Assault/Special Purpose Ration Improvement Project (ASPIP)</p> <p>Description: Continuous product improvement of special purpose rations by the integration of new technologies in nutrition, processing and packaging. 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: Integrate prototype components/technologies (e.g., commercial brick pack packaging, Multi-Purpose Individual Heating Technology (MIT)) into First Strike Ration (FSR), MCW/LRP and/or MORE menu systems to improve quality, acceptability, nutrition and expand variety. Plan and complete field testing of new ration menus in an operationally relevant environment. Continue to populate Combat Rations Database with nutritional/menu data.</p> <p>FY 2018 Plans: Will integrate prototype components/technologies into FSR, MCW/LRP and/or MORE menu systems to improve quality, acceptability, nutrition and expand variety. Will execute production testing with industry to ensure consistent ration quality, understand Performance Contract Requirements (PCR), and resolve vendor/supplier issues. Will continue to populate Combat Rations Database with nutritional/menu data.</p>		-	0.056	0.039
<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> <p>FY 2016 Accomplishments: Finalized UGR (A, H&S, E) procurement documents and standards for verification and initiate transition to DLA-TS based on BA4 Joint Service approvals. Obtained Surgeon General approval of revised UGR menus. Supported DLA-Troop Support Limited First Article production testing of new H&S and E items with industry to ensure consistent ration quality, understand PCR requirements, resolve vendor/supplier issues, and conduct confirmatory sensory, chemical, physical and shelf life testing.</p> <p>FY 2017 Plans:</p>		0.348	0.122	0.078

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Integrate prototype components/technologies into UGR-H&S, UGR-E, UGR-M and UGR-A menu systems to improve quality, acceptability, nutrition and expand variety. Complete field testing of new ration menus in an operationally relevant environment.</p> <p>FY 2018 Plans: Will finalize UGR (A, H&S, E) procurement documents and standards for verification and initiated transition to DLA-Troop Support based on BA4 Joint Service approvals. Will obtain Surgeon General approval of revised UGR menus. Will support DLA-Troop Support Limited First Article production testing of new H&S and E items with industry to ensure consistent ration quality, understand PCR requirements, resolve vendor/supplier issues, and conducted confirmatory sensory, chemical, physical and shelf life testing.</p>				
<p>Title: Group Ration Airdrop Survivability Project (GRASP)</p> <p>Description: Quantify baseline airdrop performance characteristics for current group combat ration (UGR-H&S/M/E) configurations/designs; identify survival rates (based on caloric loss and packaging damage/loss) under defined operational conditions; provide knowledge base and supporting data to generate executable load configuration changes; identify capability gaps that might warrant product/package/assembly configuration redesign and reengineering.</p> <p>FY 2017 Plans: Conduct review/analysis of airdrop test data on additional UGR configurations/versions. Will re-test/assess data and recommend packing/rigging changes. Transition updated technical data/rigging changes to DLA - Troop Support and Airdrop partners.</p>		-	0.039	-
<p>Title: Navy Shipboard Galleys</p> <p>Description: Provide continuous Research and Development (R&D) for Navy Shipboard Galleys for state-of-the-art Galley designs and equipment technologies; support Naval Supply Systems Command (NAVSUP) foodservice equipment standardization plan; integrate automated technology such as, prognostics, diagnostics, and reliability tracking.</p> <p>FY 2016 Accomplishments: Conducted preliminary Design Review/Critical Design Review (PDR/CDR) reviews. Instrumented equipment for Condition-Based Maintenance. Conducted test & evaluation of modified COTS equipment in accordance with Naval Sea Systems Command (NAVSEA) test criteria. Completed at-sea user evaluations and technical data package for transition to Navy.</p>		0.439	-	-
<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>		-	0.079	0.154

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604713A / <i>Combat Feeding, Clothing, and Equipment</i>	Project (Number/Name) 548 / <i>Mil Subsistence Sys</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>FY 2017 Plans: Develop reports, Engineering Change Proposals (ECPs) and logistical data to facilitate integration of cooking appliances into United States Marine Corp (USMC) Expeditionary Field Kitchen (EFK), Enhanced Tray Ration Heating System (ETRHS), and/or Tray Ration Heater (TRH). Transition prototype equipment and technical data to USMC.</p> <p>FY 2018 Plans: Will develop reports, ECPs and logistical data to facilitate integration of cooking appliances into USMC EFK, ETRHS, and/or TRH. Will transition prototype equipment and technical data to USMC.</p>				
<p>Title: Support to Air Force Field Feeding Modernization Efforts</p> <p>Description: Provide continuous R&D efforts for all Expeditionary Air Force squadrons. Modernize and standardize field foodservice equipment to reduce labor, maintenance, pack-out volume and cost. Increase reliability, efficiency and sustainability. Develop comprehensive specifications and technical data packages for recommended Food Service Equipment (FSE) items; test and evaluate newer commercial FSE items for expeditionary use and smaller transportation footprint; develop total overall life cycle cost of each system; test Energy Star certified FSE items that use less power; and investigate/develop appliances that use less water, increase competition on standardized designs</p> <p>FY 2016 Accomplishments: Completed preliminary design review (PDR). Initiated Basic Expeditionary Airfield Resources (BEAR) Kitchen Final Design Review. Conducted user Test & Evaluation of proposed equipment. Drafted technical test reports and provided to Air Force for review.</p> <p>FY 2017 Plans: Conduct Energy Management System (EMS) Critical Design Reviews and in-house test and evaluation. Complete the development of the Joint Service Expandable Refrigerated Container System (JSERCS). Integrate JSERCS into the BEAR kitchen system to conduct operational testing.</p> <p>FY 2018 Plans: Will complete T&E of Energy Management System prototype. Transition performance results to the Basic Expeditionary Airfield Resources (BEAR) Program Management Office. Will integrate heat recovery system technical data into the BEAR Kitchen System Technical Data Package.</p>		0.260	0.158	0.147
<p>Title: Navy Food Storage Analysis Tool (NFSAT)</p> <p>Description: Software analysis tool for Navy Foodservice that will automatically calculate all storage space factors and requirements for naval vessels based off the specific Navy Standard Core Menu (NSCM), crew size, Naval Ship's Technical Manual 096, Weights and Stability, Naval Vessel Requirements Food Service Facility Design Manual, Build Specifications 671,</p>		0.050	0.175	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
672, and Type Commander established endurance levels. Develop automated subsistence inventory management, tracking and storeroom locations for all storage areas with mobile scanning technology capability.			
FY 2016 Accomplishments: Completed Alpha version of Navy subsistence inventory management software and conduct test and evaluation of Alpha version of the software.			
FY 2017 Plans: Complete development of updated software, which will provide automated subsistence inventory management, tracking, and storeroom locations for all storage areas with mobile scanning technology capabilities. Conduct operational testing and will transition Technical Data Package, Commercial Item Descriptions, and equipment to the Navy.			
Title: Modular Integrated Kitchen System (MIKS) 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.	-	-	0.207
FY 2018 Plans: Will conduct land-based user evaluation of new integrated mounting system, prepare technical data package (TDP), and provide documentation to Navy (USN) for procurement.			
Accomplishments/Planned Programs Subtotals	1.374	0.759	0.700

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>
• 0603747A 610: <i>RDTE Soldier Support and Survivability - Food Adv Development 610</i>	0.020	5.299	6.548	-	6.548	4.648	4.158	4.273	4.225	Continuing	Continuing
• 0603747A EL1: <i>RDTE Soldier Support and Survivability - Army Field Feeding Programs EL1</i>	1.108	1.948	0.447	-	0.447	0.992	0.504	1.246	1.421	Continuing	Continuing
• 0604713A EL2: <i>RDTE Combat Feeding, Clothing, and Equip - Army Field Feeding Equip EL2</i>	0.320	1.295	3.002	-	3.002	3.179	4.207	2.865	2.032	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 / 5	R-1 Program Element (Number/Name) PE 0604713A / <i>Combat Feeding, Clothing, and Equipment</i>	Project (Number/Name) 548 / <i>Mil Subsistence Sys</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
• M65806: <i>OPA - Assault Kitchen, Field Feeding M65806</i>	3.964	7.750	4.608	-	4.608	4.129	4.565	6.145	6.268	Continuing	Continuing

Remarks

D. Acquisition Strategy

Complete Engineering and Manufacturing Development (EMD) and Demonstration of food items and equipment for transition into competitive procurement contract. Complete advanced research efforts to support Engineer Change Proposals for previously developed equipment.

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 / 5					R-1 Program Element (Number/Name) PE 0604713A / <i>Combat Feeding, Clothing, and Equipment</i>				Project (Number/Name) EL2 / <i>Army Field Feeding 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
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
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the development and demonstration and Non-Developmental Item (NDI) Commercial Off The Shelf (COTS) evaluation of combat feeding equipment to enhance soldier efficiency and survivability, and to reduce food service logistics requirements for the Army. The project supports multi-fuel, rapidly deployable field food service equipment initiatives and engineering and manufacturing development to improve equipment, enhance safety in food service, and decrease fuel and water requirements. This project develops critical enablers that support the Army's Strategic Planning Guidance by developing and integrating critical expeditionary capabilities that maintain readiness; provide effective solutions that reduce the resource and operational energy footprint; provide modernized equipment; and enhance the field Soldier's well being. This project also reduces sustainment requirements, related Combat Support/Combat Service Support (CS/CSS) demands on lift, the 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
Title: Ice Making System	0.320	-	-
Description: Develops an add-on ice making capability that automatically dispenses and seals 10 pound(lbs) bags at a rate of a minimum of 3,600 pounds of ice per day. This capability is based upon Army current operational requirements for ice which is four pounds per Soldier per day. This capability enables support for up to 900 personnel. Current operations require external support to provide personnel with ice for cooling drinking water in extremely arid environments. This capability will reduce the sustainment risk and cost associated with transporting this commodity from external sources. The objective requirement enables stockage of ice to assist with surge operations.			
FY 2016 Accomplishments: Awarded contract for development of prototype Containerized Ice Making Systems and required Developmental Testing (DT).			
Title: Battlefield Kitchen (BK)	-	1.295	3.002
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			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604713A / <i>Combat Feeding, Clothing, and Equipment</i>	Project (Number/Name) EL2 / <i>Army Field Feeding Equipment</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
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.			
<i>FY 2017 Plans:</i> Oversee contractor integration of developmental components and mature government supplied components into working BK prototype. Maintain concurrent development of Integrated Logistics Support (ILS) documentation and provisioning of government supplied mature components and subsystems.			
<i>FY 2018 Plans:</i> Complete integration of BK systems. Conduct production prove out testing and limited user testing in accordance with Test and Evaluation Master Plan (TEMP). Complete required logistical support documentation. Prepare Milestone C documentation and preparation for production decision.			
Accomplishments/Planned Programs Subtotals	0.320	1.295	3.002

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>
• RDT&E 643747.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
• OPA R62830: <i>Battlefield Kitchen, Field Feeding</i>	-	-	-	-	-	-	6.071	7.665	8.309	Continuing	Continuing

Remarks

D. Acquisition Strategy
Complete System Development and Demonstration of food items and equipment for transition into competitive procurement contract. Complete advanced research efforts to support Engineer Change Proposals for previously developed 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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604715A / <i>Non-System Training Devices - Eng 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	-	26.768	35.807	43.575	-	43.575	46.260	26.354	25.792	21.712	Continuing	Continuing
241: <i>Nstd Combined Arms</i>	-	23.833	32.769	43.575	-	43.575	46.112	26.214	25.653	21.712	Continuing	Continuing
573: <i>Program Executive Office Simulation, Training Spt</i>	-	2.935	3.038	0.000	-	0.000	0.148	0.140	0.139	0.000	0.000	6.400

A. Mission Description and Budget Item Justification

Program Element funds development of Non-System Training Devices to support force-on-force training at the Combat Training Centers (CTC), general military training, and training on more than one item/system, as compared with system devices which are developed in support of a specific item/weapon system. Army training devices and training simulations contribute to the modernization of the forces by enabling readiness and strengthening combat effectiveness through realistic training solutions for the Warfighter. Training devices maximize the transfer of knowledge, skills, and experience from the training situation to a combat situation. Force-on-force training at the National Training Center (NTC), Ft. Irwin, CA; Joint Readiness Training Center (JRTC), Ft. Polk, LA, and Joint Multinational Readiness Center (JMRC), formerly the Combat Maneuver Training Center (CMTC), Hohenfels, Germany; and battle staff training in Battle Command Training Program (BCTP) provide increased combat readiness through realistic collective training in low, mid, and high intensity scenarios. Project 241, Non-System Training Devices-Combined Arms, develops simulation training devices for Army-wide use, including the CTCs. Project 573 funds key organizational support to Army/DoD Transformation via innovative simulation and training device efforts. Program Executive Office (PEO) Simulation, Training and Instrumentation (STRI's) unique geographic co-location with other services facilitates joint training solutions in a common environment.

FY 2018 Project 241 funds significant development efforts in support of U.S. Army Training and Readiness on the Combat Training Center Instrumentation Systems (CTC-IS), Instrumentable-Multiple Integrated Laser Engagement System (I-MILES), Home Station Instrumentation Training System (HITS), Common Training Instrumentation Architecture (CTIA), Target Modernization, Medical Simulation Training Center (MSTC), Live, Virtual, Constructive Integrating Architecture (LVC-IA), OPFOR Integrated Air Defense System (IADS), Soldier Virtual Trainer Program (SVT) New Start, Digital Range Training System (DRTS) New Start, and Soldier Fitness and Suicide Prevention.

FY 2018 Project 573 is the first year that realigns Government authorizations and associated funding to an Army Management Headquarter Account (AMHA), which zeroed out the funding in FY 2018. This was done in accordance with a Program Decision Memorandum.

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604715A / <i>Non-System Training Devices - Eng 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	27.155	30.807	31.084	-	31.084
Current President's Budget	26.768	35.807	43.575	-	43.575
Total Adjustments	-0.387	5.000	12.491	-	12.491
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.887	-			
• Adjustments to Budget Years	0.500	0.000	12.491	-	12.491
• FY17 Request for Additional Appropriations	0.000	5.000	0.000	-	0.000

Change Summary Explanation

The FY 2017 Request for Additional Appropriations included an increase of \$5.000M to meet urgent requirements to develop, produce, procure, and integrate critical Combat Training Center (CTC) Opposing Forces (OPFOR) Integrated Air Defense System (IADS) capabilities to replicate threats in accordance with the Army Operating Concept (AOC). This is a NEW START.

The FY 2018 delta is due to increases in Project 241 for OPFOR Integrated Air Defense System (IADS) and Digital Range Training System (DRTS) from Modernize the Army Package A, and Project 573 was zeroed out to realign the Government authorizations and associated funding to an Army Management Headquarter Account.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604715A / <i>Non-System Training Devices - Eng Dev</i>				Project (Number/Name) 241 / <i>Nstd Combined Arms</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
241: <i>Nstd Combined Arms</i>	-	23.833	32.769	43.575	-	43.575	46.112	26.214	25.653	21.712	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common Training Instrumentation Architecture (CTIA) program is the foundation architecture of the Live Training Transformation Family of Training Systems (LT2-FTS). The program contains critical core product-line architecture which provides commonality across training instrumentation systems and interoperability across Live, Virtual, Constructive Integrated Training Environment (LVC-ITE) and joint training systems. CTIA includes Army owned software components, architecture services, standards, protocols and governance used by domain-specific Live Training Transformation (LT2) and Live Training Systems (LTS) to include instrumented Force-On-Force (FOF) and Force-On-Target (FOT) training requirements. The CTIA also provides Post Deployment Software Support (PDSS) and technology refresh for the LT2 family of LTS supporting over 22 live instrumented training products which are fielded at over 200 CONUS and OCONUS sites across the Army.

Combat Training Center Instrumentation System (CTC-IS) funds the continued development of the existing Instrumentation Systems (IS) at the National Training Center (NTC), Joint Readiness Training Center (JRTC) and Joint Multinational Readiness Center (JMRC). CTC-IS funds the continued development of the Range Communication System at the NTC and JRTC, to provide high-fidelity live, virtual, and constructive brigade training rotations which prepare Brigade Combat Teams (BCTs), Joint partners, and supporting units to deploy in support of the Army Sustainable Readiness Model (SRM). The CTCs primary goal is to develop agile and adaptive leaders at the tactical, operational and strategic levels while providing BCTs the core training necessary to conduct decisive action in a dynamic operating environment.

The Instrumentable-Multiple Integrated Laser Engagement System (I-MILES) program provides realistic, real-time casualty effects for force-on-force tactical engagement training scenarios and its ability to integrate into training instrumentation systems provide for high fidelity combined arms combat exercises supporting the 39th Chief of the Staff of the Army #1 priority of "Readiness". Due to their modular design, I-MILES is required for use at the Home Station, the Combat Training Centers (CTCs) and in theater of operations to meet force-on-force training requirements. I-MILES program funding provides the Development and Integration of new vehicle and dismount weapon systems meeting the Common Operating Environment (COE) requirements, as well as embedded Tactical Engagement Simulation (TES) development. This includes new development efforts of the Live Training Engagement Composition (LTEC), increasing simulation of Probability of Kill (Pk) for training realism and improving integration on new weapon platforms (i.e. Joint Light Tactical Vehicle (JLTV), Armored Multi-Purpose Vehicle (AMPV), M4A2 Plus Rifle and Stryker Engineering Change Proposal (ECP) with 30mm Gun).

The Home Station Instrumentation Training System (HITS) provides a high-fidelity deployable instrumented training capability to support platoon thru battalion level Live Force-on-Force Training. HITS tracks location of soldiers and vehicles and simulates weapons' effects and engagements, allowing units to "Train as they Fight" against live opponents. HITS provides accurate feedback to training units. HITS consists of light deployable components that can be rapidly assembled/disassembled and transported to support deployed training. HITS integrates with future and legacy MILES. HITS is a member of the Live Training Transformation (LT2) family of training systems and shares several hardware and software components with the Instrumentation Systems (IS). HITS provides the Live domain for Live-Virtual-Constructive (LVC) training integration.

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<p>The Medical Simulation Training Center (MSTC) provides realistic medical training to both medical and non-medical Soldiers in the Active, Reserve, and National Guard. MSTCs provide hands-on instruction on the latest battlefield trauma and critical care techniques based on Army Medical Department (AMEDD) approved performance oriented Program of Instruction (POI). Medical treatment validation exercises simulate the high stress of performing medical interventions in combat. MSTC supports Unit Medical Readiness by validating Combat Medic (68W) Emergency Medical Technician (EMT) biennial recertification requirements and provides Combat Lifesaver (CLS) training to non-medical Soldiers.</p> <p>The Engagement Skills Trainer (EST) is the unit/institutional, indoor, multipurpose, multi-lane, small arms, crew-served and individual anti-tank training simulation that enables training across three different modes: individual marksmanship; small unit (collective) gunnery and tactical training; and judgmental use of force (shoot/don't shoot), which includes escalation of force/graduated response scenarios.</p> <p>The Call for Fire Trainer (CFFT) family of systems is a lightweight, rapidly deployable, observed fire training system that provides simulated battlefield training for Fire Support Specialists (FSS), Joint Fires Observers (JFO), and Soldiers. The system provides simulated battlefield training to conduct Indirect Fires, Close Air Support, Close Combat Attack, and Naval Surface Fire Support. The CFFT Immersive System provides the capability for Army, Joint, Multinational and Special Operations Forces to conduct advanced, complex and realistic fires training at the FIRES Center of Excellence, Ft Sill, OK. CFFT is a critical training enabler to support Warfighters in applying precision fires on target to prevent fratricide and minimize collateral damage.</p> <p>The Live, Virtual, Constructive Integrating Architecture (LVC-IA) provides a net-centric linkage that collects, retrieves and exchanges data among LVC Training Aids, Devices, Simulations, and Simulators (TADSS) (to include: AVCATT, CCTT, GFT, HITS, JLCCTC and SE Core) and Mission Command Systems. The LVC-IA defines "how" information is exchanged among the different LVC domains and the Mission Command Systems. The LVC-IA provides enterprise level tools for exercise control, after action review, and system information assurance. It develops hardware and software to interface the different Live, Virtual, Constructive and Gaming communication protocols and to provide a correlated common operating picture for the training audience on their organic Mission Command equipment. The integration of the LVC TADSS with the Mission Command equipment will enable larger and more robust training events, to better prepare U.S. Soldiers for their missions at an overall reduced cost. The end-state goal is to enable an LVC Integrated Training Environment that can replicate Operational Environments in a cost effective manner to provide a high level of value-added training and mission rehearsal opportunities to Army Commanders and their Soldiers. In FY17, program will continue Version 3 development activities; FY18 request will commence Version 3 testing and validation, concurrency with mission command systems and initiate Version 4 development activities.</p> <p>The Target Modernization program provides a common open architectural framework, standards, specifications, and interfaces for live fire target devices, a common target control system for all range types, and innovative technologies to enhance training realism and reduce life cycle costs on the ranges. The Target Modernization primary goal is the development of trackless target systems, high fidelity dynamic infrared representations, non-contact ballistic hit detections, and augmented reality on live fire ranges; increasing training realism and lowering life cycle costs.</p> <p>The Army identified an operational gap in the training strategy for the OPFOR Integrated Air Defense System (IADS). It's a collection of enemy weapons systems that engage Army aviation assets. Training Aircraft Survivability Equipment (ASE) Stimulation Suite (TASS) is a live training system consisting of aircraft components</p>		

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and ground emitters that replicate current and emerging enemy Air Defense systems. Its fidelity supports individual pilot training as well as the collective training requirements of the Brigade Combat Team to fully plan, prepare, execute and react against an enemy air defense weapons at the Combat Training Centers (CTC).

The Digital Range Training System (DRTS) provides new and modern ranges capable of training, evaluating and stressing Soldiers and their modern equipment with a realistic train-as-you-fight environment. Four standard training ranges Digital Multi-Purpose Range Complex (DMPRC), Digital Multi-Purpose Training Range (DMPTR), Battle Area Complex (BAX) and Digital Air Ground Integrated Range (DAGIR) will utilize all available combat systems capabilities, and digitally integrate them to manage all forces undergoing individual and collective live-fire training and qualification. These Training Systems replace obsolete, inadequate training methods and equipment in order to simulate new weapon systems, challenge Soldiers, incorporate the Digitized Force, and provide enhanced training data collection and After Action Review (AAR) capabilities. They incorporate digital system training as well as integrate multiple ranges and training environments for the training units.

The Army identified a requirement for a Soldier Virtual Trainer (SVT) to replace the Engagement Skills Trainer (EST) II and Call for Fire Trainer (CFFT) III. The SVT Program (new start) will enable Army Readiness through dismounted collective maneuver capability; will provide individual and crew-served weapons skill development, and will enable Joint fires training, and will exercise Use of Force decision making.

Comprehensive Soldier & Family Fitness (CSF2) is research and development efforts that include Future Soldier Assessment Tool (DASH-R) Project, Global Assessment Tool (GAT) 3.0 Project, and Program Evaluation (PE) Project.

FY 2018 Project 241 funds significant development efforts in support of U.S. Army Training and Readiness on the Combat Training Center Instrumentation Systems (CTC-IS), Instrumentable-Multiple Integrated Laser Engagement System (I-MILES), Home Station Instrumentation Training System (HITS), Common Training Instrumentation Architecture (CTIA), Target Modernization, Medical Simulation Training Center (MSTC), Live, Virtual, Constructive Integrating Architecture (LVC-IA), OPFOR Integrated Air Defense System (IADS), Soldier Virtual Trainer Program (SVT) New Start, Digital Range Training System (DRTS) New Start, and Soldier Fitness and Suicide Prevention.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Common Training Instrumentation Architecture (CTIA) program.	4.118	2.550	2.910	-	2.910
Description: Continue EMD phase contract activities for the CTIA program to provide common architecture capabilities.					
FY 2016 Accomplishments: Provided essential common architecture capabilities essential to the development, fielding, technology and capability of Live Training Systems (LTS) which included the Combat Training Centers-Instrumentation Systems (CTC-IS), Integrated Military Operations in Urbanized Terrain Training System (IMTS), Home Station					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Instrumentation Systems (HITS), Digital Ranges Training System (DRTS) training instrumentation programs and the Live, Virtual, Constructive-Integrated Training Environment (LVC-ITE) interoperability initiatives. FY 2017 Plans: Continue development of CTIA to provide the common architecture capabilities that are essential for development, fielding, technology and capability insertion for Live Training Systems (LTS) to include: the Combat Training Centers-Instrumentation Systems (CTC-IS), Integrated Military Operations in Urbanized Terrain Training System (IMTS), Home Station Instrumentation Systems (HITS), Digital Ranges Training System (DRTS) training instrumentation programs and the Live, Virtual, Constructive-Integrated Training Environment (LVC-ITE) interoperability initiatives. FY 2018 Base Plans: Continue development of CTIA to provide the common architecture capabilities that are essential for development, fielding, technology and capability insertion for Live Training Systems (LTS) to include: the Combat Training Centers-Instrumentation Systems (CTC-IS), Integrated Military Operations in Urbanized Terrain Training System (IMTS), Home Station Instrumentation Systems (HITS), Digital Ranges Training System (DRTS) training instrumentation programs and the Live, Virtual, Constructive-Integrated Training Environment (LVC-ITE) interoperability initiatives.					
Title: Government Program Management for the Common Training Instrumentation Architecture (CTIA) program. Description: Government Program Management for the CTIA program. FY 2016 Accomplishments: Completed various efforts pertaining to Program Management for the Common Training Instrumentation Architecture (CTIA) program such as guidance and oversight, project coordination, meetings/site visits, etc. FY 2017 Plans: Program Management for the Common Training Instrumentation Architecture (CTIA) program. FY 2018 Base Plans: Program Management for the Common Training Instrumentation Architecture (CTIA) program.	0.364	0.334	0.283	-	0.283
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Combat Training Center Instrumentation System (CTC-IS).	2.665	5.554	3.362	-	3.362

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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: Continue EMD phase contract activities for the CTC-IS.</p> <p>FY 2016 Accomplishments: Combat Training Center Instrumentation System (CTC-IS) funded the continued development of the existing Instrumentation Systems (IS) at the National Training Center (NTC), Joint Readiness Training Center (JRTC) and Joint Multinational Readiness Center (JMRC). Funding will be used to develop a common Range Communications System (RCS) that can be implemented at all both NTC and JRTC for increased entity tracking coverage and accuracy in order to increase After Action Review fidelity for Brigade Combat Team rotations to better prepare units for deployment.</p> <p>FY 2017 Plans: Combat Training Center Instrumentation System RDTE funding will focus on both architectures to support future instrumentation systems such as the Common Domain Solution (CDS) and IS Preparation; RDTE will provide up front analysis of new technologies and efficiencies needed to make Continuous Technology Refresh decisions that will reduce the Total logistical footprint of the system, improve reliability and performance and reduce cost of the system over its Total Life Cycle. These analysis will also focus on pre-positioning needed architectures and design to support the future IS.</p> <p>FY 2018 Base Plans: Combat Training Center Instrumentation System (CTC-IS) will fund the continued development of the existing Instrumentation Systems (IS) at the National Training Center (NTC), Joint Readiness Training Center (JRTC) and Joint Multinational Readiness Center (JMRC). Funding will also be used to establish a deliberate approach to Life Cycle Management (LCM) of Live Training Family of Systems, providing the framework for future Life Cycle Efforts for the Hardware Product Line Framework.</p>					
<p>Title: Government Program Management for the Combat Training Center Instrumentation System (CTC-IS) program.</p> <p>Description: Government Program Management for the CTC IS program.</p> <p>FY 2016 Accomplishments: Program Management for the Combat Training Center Instrumentation System (CTC-IS) program.</p> <p>FY 2017 Plans:</p>	0.974	1.546	1.440	-	1.440

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Program Management for the Combat Training Center Instrumentation System (CTC-IS) program; providing support of program office management and administrative processes. FY 2018 Base Plans: Program Management for the Combat Training Center Instrumentation System (CTC-IS) program.					
Title: Government Program Management for the Instrumentable-Multiple Integrated Laser Engagement System (I-MILES) Program. Description: Government Program Management for the I-MILES program. FY 2017 Plans: Government Program Management cost for the Instrumentable-Multiple Integrated Laser Engagement System (I-MILES) Program. This is the first year of RDTE for the I-MILES program. FY 2018 Base Plans: Government Program Management cost for the Instrumentable-Multiple Integrated Laser Engagement System (I-MILES) Program. This is the second year of RDTE for the I-MILES program.	-	0.304	0.319	-	0.319
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Instrumentable-Multiple Integrated Laser Engagement System (I-MILES). Description: EMD phase contract activities for the I-MILES program. FY 2017 Plans: RDTE funding will assist in analyzing, developing and testing the Live Training Engagement Composition (LTEC) and integration of the Tactical Engagement Simulation (TES) Componentized Architecture into existing and new I-MILES capabilities to improve training realism during Force on Force (FoF) training increasing performance and reducing overall lifecycle costs. RDTE reduces the risk of integration into vehicle weapon platforms and Vehicular Integration for C4ISR/EW Interoperability (VICTORY) Architecture while maintaining relevancy into emerging Weapon Systems (Joint Lite Tactical Vehicle (JLTV), Armored Multi-Purpose Vehicle (AMPV), Stryker Engineering Change Proposal (ECP) with 30mm Gun). RDTE will assist in maintaining I-MILES relevancy as the Army premier Live Force-on-Force training system. This is the first year of RDTE for the I-MILES program. FY 2018 Base Plans: RDTE funding will assist in analyzing, developing and testing the Live Training Engagement Composition (LTEC) and integration of the Tactical Engagement Simulation (TES) Componentized Architecture into existing and new	-	1.041	2.611	-	2.611

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
I-MILES capabilities to improve training realism during Force on Force (FoF) training increasing performance and reducing overall lifecycle costs. RDTE reduces the risk of integration into vehicle weapon platforms and Vehicular Integration for C4ISR/EW Interoperability (VICTORY) Architecture while maintaining relevancy into emerging Weapon Systems (Joint Lite Tactical Vehicle (JLTV), Armored Multi-Purpose Vehicle (AMPV), Stryker Engineering Change Proposal (ECP) with 30mm Gun). RDTE will assist in maintaining I-MILES relevancy as the Army premier Live Force-on-Force training system. This is the second year of RDTE for the I-MILES program.					
<p>Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Home Station Instrumentation Training System (HITS) program.</p> <p>Description: EMD phase contract activities for the HITS program.</p> <p>FY 2016 Accomplishments: Integrated and tested the interface between HITS (v3 and v4) and the latest versions of the Live, Virtual, and Constructive Integrating Architecture (LVC-IA v2.0) to sustain the Integrated Training Environment (ITE) at Home Stations.</p> <p>FY 2017 Plans: Develop, integrate, and test the HITS interfaces with new versions of the Tactical Engagement Simulation System (TESS) (ex. VTESS) and provide upgrades to existing fielded Instrumentable-Multiple Laser Engagement System (I-MILES).</p> <p>FY 2018 Base Plans: Integrate and test the interface between HITS (v3 and V4) and the latest versions of the Live, Virtual and Constructive Integrating Architecture (LVC-IA 3.0) to sustain the Integrated Training Environment (ITE) at Home Stations.</p>	1.484	1.683	1.646	-	1.646
<p>Title: Government Program Management for the Home Station Instrumentation System (HITS) program.</p> <p>Description: Government Program Management for the Home Station Instrumentation System (HITS) program.</p> <p>FY 2016 Accomplishments: Program Management for the Home Station Instrumentation System (HITS) program.</p> <p>FY 2017 Plans:</p>	0.300	0.307	0.316	-	0.316

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Program Management for the Home Station Instrumentation System (HITS) program. FY 2018 Base Plans: Program Management for the Home Station Instrumentation System (HITS) program.					
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Medical Simulation Training Center (MSTC). Description: EMD phase contract activities for the MSTC program. FY 2016 Accomplishments: Tactical Combat Casualty Care (TC3) contract awarded for the Rapid Equipping Force TC3 initiative to integrate and field the TC3 packages to 8 deploying Brigades. This is part of the EMD effort to evaluate the correct configuration of equipment and training support package for a follow-on Tactical Combat Casualty Care - Exportable (TC3-X) Package. Medical Training Command & Control (MT-C2) developmental contract awarded; seeks to automate the heavily weighted manually controlled MSTC control center and provide a standardized design and training methodology providing a framework fitted to reconfigurable enabling technology and supporting training devices that maximize training effectiveness for both classroom and full tactical training capabilities. FY 2017 Plans: Enhancement of Birthing Simulator by developing realistic simulated tissue and sensors that will gather objective metrics regarding pressure, fetal position, etc. Enhancement of Intraosseous Fluid Resuscitation Training by including anatomical accuracy, tissue properties, and rapid refresh of the system to support high training OPTEMPO. FY 2018 Base Plans: Enhancement of the Instructor Support System (ISS) by improving the combat training environments to enhance the Soldier's training experience through more realistic training scenarios.	1.405	0.530	0.200	-	0.200
Title: Government Program Management for the Medical Simulation Training Center (MSTC) program. Description: Government Program Management for the MSTC program. FY 2016 Accomplishments: Government Program Management for the Medical Simulation Training Center (MSTC) program. FY 2017 Plans:	0.177	0.167	0.167	-	0.167

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Government Program Management for the Medical Simulation Training Center (MSTC) program. FY 2018 Base Plans: Government Program Management for the Medical Simulation Training Center (MSTC) program.					
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Engagement Skills Trainer (EST) program. Description: EMD phase contract activities for the Engagement Skills Trainer (EST) program. FY 2016 Accomplishments: Developed EST Dynamic Terrain to accurately portray all battlefield effects, in accordance with the Contemporary Operating Environment (COE), across the full range of military operations including: friendly and enemy forces and their doctrine, tactics, techniques and procedures; all military recognized terrain; atmospheric and weather conditions; specific enemy and friendly vehicles and equipment; dynamic, correlated terrain; the effects of munitions on personnel, vehicles, structures; and develop prior years efforts (weapons, optics, etc). Developed enhanced capabilities in accordance with the capability manager's priorities. FY 2017 Plans: Will continue to develop EST Dynamic Terrain to accurately portray all battlefield effects, in accordance with the Contemporary Operating Environment (COE), across the full range of military operations including: friendly and enemy forces and their doctrine, tactics, techniques and procedures; all military recognized terrain; atmospheric and weather conditions; specific enemy and friendly vehicles and equipment; dynamic, correlated terrain; the effects of munitions on personnel, vehicles, structures; and develop prior years efforts (weapons, optics, etc). Develop enhanced capabilities in accordance with the capability manager's priorities.	1.143	1.002	-	-	-
Title: Call For fire Trainer (CFFT) Program Government System Test and Evaluation. Description: Government System Test and Evaluation for the Call For fire Trainer (CFFT) Program. FY 2017 Plans: Develop updates to maintain currency of the CFFT in order to meet the needs of the operational and institutional force, informed by the Modernization of Force initiative including precision engagement and tactical software interoperability.	-	1.314	-	-	-
Title: Live, Virtual, Constructive Integrating Architecture (LVC-IA) Engineering and Manufacturing Development (EMD) phase contract activity.	5.706	4.429	2.762	-	2.762

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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: Continue EMD phase contract activities for the LVC-IA program.</p> <p>FY 2016 Accomplishments: Live, Virtual, and Constructive - Integrating Architecture (LVC-IA) program successfully completed system integration and testing to include Government Acceptance Testing (GAT) and First User Assessment (FUA) of Version 2 capability. The program began design and development of LVC-IA Version 3 capability.</p> <p>FY 2017 Plans: Continue system development, integration and demonstration of the LVC-IA Version 3 capability.</p> <p>FY 2018 Base Plans: Live, Virtual, and Constructive – Integrating Architecture (LVC-IA) program will complete system development, integration and demonstration of the LVC-IA Version 3 capability. Additionally, LVC-IA will perform concurrency activities in support of LVC-IA interoperability with TADSS and other Mission Command Systems. The program will begin design and development of LVC-IA Version 4 capability.</p>					
<p>Title: Government Program Management for the Live, Virtual, Constructive Integrating Architecture (LVC-IA) Program.</p> <p>Description: Government Program Management for the LVC-IA Program.</p> <p>FY 2016 Accomplishments: Provided program management, engineering and technical oversight, contract support, and travel for the LVC-IA Program.</p> <p>FY 2017 Plans: Will provide program management, engineering and technical oversight, contract support, and travel for the LVC-IA Program.</p> <p>FY 2018 Base Plans: Will provide program management, engineering and technical oversight, contract support, and travel for the LVC-IA Program.</p>	1.181	1.782	1.679	-	1.679
<p>Title: Live, Virtual, Constructive Integrating Architecture (LVC-IA) Program Government System Test and Evaluation.</p> <p>Description: Government System Test and Evaluation for the LVC-IA Program.</p>	1.133	2.199	2.372	-	2.372

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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> LVC-IA continued integration testing support on developed components for LVC-IA for interoperability with TADSS and other Mission Command Systems. LVC-IA conducted Federation Integration, Functional Verification and System Measurement of Performance (SMP) events, completed Test Readiness Review (TRR) and Government Acceptance Testing for Version 2. The program began efforts for Version 3 in FY16 upon the completion of Version 2.</p> <p><i>FY 2017 Plans:</i> LVC-IA will continue integration testing and evaluation activities in support of LVC-IA interoperability with TADSS and other Mission Command Systems. LVC-IA will conduct Federation Integration Events in preparation for final test activities for Version 3.</p> <p><i>FY 2018 Base Plans:</i> LVC-IA will finalize Federation Integration, Functional Verification and System Measurement of Performance (SMP) events, complete Test Readiness Review (TRR) and Government Acceptance Testing for Version 3; the program will begin efforts for Version 4 in FY18 once Version 3 efforts are completed. Additionally, LVC-IA will continue integration testing and evaluation activities in support of LVC-IA interoperability with TADSS and other Mission Command Systems.</p>					
<p><i>Title:</i> Engineering and Manufacturing Development (EMD) phase contract activity for the Target Modernization program.</p> <p><i>Description:</i> EMD phase contract activities for the Target Modernization program.</p>	1.929	2.054	2.237	-	2.237
<p><i>FY 2016 Accomplishments:</i> Developed and integrated trackless moving type targets with behavioral capabilities into the Government owned target control system Targetry Range Automated Control and Recording (TRACR). The design includes a trackless target that can be utilized on unimproved terrain, and is capable of independent behaviors based on training doctrine, skills, readiness and style of learning to enhance realism and feedback for the Soldier. Bridge technology transition from an on-going SBIR effort that began in FY13.</p> <p><i>FY 2017 Plans:</i></p>					

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continuation of FY16 efforts to develop and integrate autonomous trackless moving type targets with behavioral capabilities into the Government owned target control system Targetry Range Automated Control and Recording (TRACR). Transition technology to the Future Army System of Integrated Targets (FASIT) Program. FY 2018 Base Plans: Finalization of the trackless moving type target effort initiated in FY16 via development and testing of Technology Readiness Level (TRL) 9 prototype systems. Prepare system for transition into low rate initial production, and eventual transition to various programs of record. Start the design and development of a dynamic infrared representation capability to display real-time posture based, high fidelity IR/thermal images on target silhouettes. Advance thermal threat images to match thermal sight capabilities. Removes thermal generation systems from line of fire on ranges. Bridge technology transition from an on-going SBIR effort that began in FY15.					
Title: Comprehensive Soldier & Family Fitness (CSF2) Description: Comprehensive Soldier & Family Fitness (CSF2), the Army community's premier resilience and health training program.	1.254	-	-	-	-
FY 2016 Accomplishments: Developed, tested, and implemented a variety of psychometric instruments administered on an electronic world-wide delivery platform; evaluation of CSF2 training effectiveness at influencing objective outcomes in the health and work performance domains; applying advanced statistical analysis techniques to emerging human subjects problems identified by the Army senior leadership (e.g., suicide, violent crime, sexual assault / harassment, etc).					
Title: Soldier Fitness Program Description: Dollars belong to the Soldier Fitness Program.	-	0.973	0.892	-	0.892
FY 2017 Plans: Dollars belong to Soldier Fitness Program.					
FY 2018 Base Plans: Dollars belong to the Soldier Fitness Program.					
Title: Suicide Prevention Program FY 2018 Base Plans: Dollars belong to the Suicide Prevention Program.	-	-	2.228	-	2.228
Title: Government Program Management for the Soldier Virtual Trainer Program (SVT)	-	-	0.051	-	0.051

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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: New start - Government program management for SVT in FY18.</p> <p>FY 2018 Base Plans: Government Program Management costs for the Soldier Virtual Trainer (SVT) Program which is a new start in FY18.</p>					
<p>Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Digital Range Training System (DRTS)</p> <p>Description: EMD Phase for the DRTS Program</p> <p>FY 2018 Base Plans: RDTE funding will be used to begin the development of a prototype for the Digital Range Training System (DRTS) at Ft. Benning of the Service Oriented Architecture (SOA) based Common Training Instrumentation Architecture (CTIA) version 4 software product line. Effort will focus on prototyping and validating the new software on IT equipment and demonstrating that the DRTS capabilities are still supported. In addition, funding will be used to develop a prototype Integrated Player Unit (IPU) for the DRTS system that combines the multiple boxes used today into one unit, makes the IPU more rugged to withstand the operational environment, and makes the system easier and faster to install. This will make the DRTS more usable by the training units and easier to support. This is the first year of RDTE for the DRTS program.</p>	-	-	1.600	-	1.600
<p>Title: Engineering and Manufacturing Development (EMD) phase contract activity for the OPFOR Integrated Air Defense System (IADS)</p> <p>Description: EMD phase contract activities for the IADS Program</p> <p>FY 2017 Plans: Begin development of the modification of the Apache Helicopter capability to train against the OPFOR Integrated Air Defense System (IADS). Funding will also support the addition of embedded software to model the Aircraft Survivability Equipment (ASE) and stimulate the helicopter display to inform pilots of opposing threats. Modification efforts will improve capability and integrate the inserted software into the Combat Training Centers (CTC), to support force on force collective training exercises. This is the first year of RDTE for the IADS program.</p> <p>FY 2018 Base Plans:</p>	-	4.812	15.946	-	15.946

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
RDTE funding will support the ongoing modification of the Apache Helicopter capability to train against the OPFOR Integrated Air Defense System (IADS). Funding will also support the addition of embedded software to model the Aircraft Survivability Equipment (ASE) and stimulate the helicopter display to inform pilots of opposing threats. Modification efforts will also expand the capability to the Blackhawk and Chinook Helicopters while integrating the software into the Combat Training Centers (CTC), to support force on force collective training exercises.					
Title: Government Program Management for the OPFOR Integrated Air Defense System (IADS) Program FY 2017 Plans: Will provide program management, engineering and technical oversight, contract support, and travel for the IADS Program. This is the first year of RDTE for the IADS Program. FY 2018 Base Plans: Will provide program management, engineering and technical oversight, contract support, and travel for the IADS Program.	-	0.188	0.554	-	0.554
Accomplishments/Planned Programs Subtotals	23.833	32.769	43.575	-	43.575

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
• Training Devices, Non-System (OPA): <i>Training Devices, Non-System (OPA)</i>	278.141	253.050	262.989	2.700	265.689	245.769	199.757	188.341	186.199	Continuing	Continuing
• CTC Support (OPA): <i>CTC Support (OPA)</i>	74.916	80.708	88.888	-	88.888	80.941	112.049	105.120	97.824	Continuing	Continuing

Remarks

D. Acquisition Strategy
Competitive development efforts based on performance specifications.
1. In FY17, Combat Training Center Instrumentation Systems (CTC-IS) System RDTE funding will be used for development of a Cross Domain Solution (CDS) needed due to new IA requirements; will award a new delivery order (DO) to General Dynamics Missions Systems under the Live Training Transformation Consolidated Product-line Management Next (LT2 CPM Next) contract. CPM Next was completed as a Competitive 5 year Single Award Indefinite-Delivery/Indefinite-Quantity (IDIQ) Contract, the DO will have a one-year base and four single-year option period. In FY18, CTC-IS System RDTE funding will be used to fund a Life Cycle Product-line Management

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604715A / <i>Non-System Training Devices - Eng Dev</i>	Project (Number/Name) 241 / <i>Nstd Combined Arms</i>
<p>(LCPM) contract structured as a 5 year Single Award Indefinite-Delivery/Indefinite-Quantity (IDIQ) Contract for the implementation of a Hardware Product Line (HPL), the contractor is to be selected. The strategy is to establish a deliberate approach to Life Cycle Management (LCM) of Live Training Family of Systems, providing the framework for future Life Cycle Efforts for the Hardware Product Line Framework.</p> <p>2. In FY17, Instrumentable-Multiple Integrated Laser Engagement System (I-MILES) will award a new delivery order (DO) to General Dynamics Mission Systems on the Live Training Transformation Consolidated Product-line Management Next (LT2 CPM Next) contract which will provide flexibility for unknown requirements and will address the known requirements that fall within multiple categories: Architecture Maturation; Common Operating Environment (COE); Embedded Training; System level testing of existing and future Live Training Engagement Composition (LTEC) services for dismount and vehicle use cases; Architecture Verification/Validation of LTEC and a componentized architecture; Retrofitting I-MILES systems (Individual Weapons System 1 & 2 (IWS), Tactical Vehicle System (TVS), Combat Vehicle Tactical Engagement Simulation System (CVTESS)) with LTEC and Live Player Area Network (LPAN); Development, Integration, Form, Fit & Function for new vehicles/systems platforms. In FY18, I-MILES will award a new Competitive 5 year Single Award Indefinite-Delivery/Indefinite-Quantity (IDIQ) Contract for relevancy.</p> <p>3. In FY16, the Home Station Instrumentation Training System (HITS) program awarded a delivery order (DO) to General Dynamics Missions Systems under the LT2 CPM Next contract. The DO has a one-year base and four single-year option periods beginning in January 2016.</p> <p>4. In FY15, the Common Training Instrumentation Architecture (CTIA) program awarded a contract to General Dynamics Mission Systems which has a one-year base and four single-year option periods through FY20.</p> <p>5. In FY17, the Target Modernization (Target Mod) program will incrementally fund the Phase III SBIR contract to Pratt and Miller Engineering Trackless Moving Target (TMT) contract which has a one year base and two year options periods. The contract provides for the continued product development (from TRL 7 to TRL 9). The original effort was initiated under a Small Business Innovation Research (SBIR) contract. In FY18, Target Mod will award a Phase III SBIR to JRM Enterprises to initiate the maturation of the Dynamic Infrared Representation system (TRL 7 to TRL 9).</p> <p>6. In FY10, the Live, Virtual, Constructive Integrating Architecture (LVC-IA) program awarded a contract to Cole Engineering and Science, Inc. (CESI) which had a two-year base and three single-year option periods beginning in June 2010. The contract provided for the development, fielding and training of each version capability to the designated Basis of Issue Plan (BOIP) sites and provided Post-Deployment Software Support (PDSS) for all currently fielded versions. The LVC-IA Enhanced Capability contract is the competitively awarded follow-on effort awarded in 3rd Quarter FY16. This contract has a two-year base and four single-year option periods to provide the additional capabilities for Version 3 and beyond.</p> <p>7. Soldier Virtual Trainer (SVT) is a new start in FY18 and program will competitively award an IDIQ contract with five option years in FY19. The contract will be a firm fixed price contract.</p> <p>8. Digital Range Training System (DRTS) will award two standalone delivery orders (DO) to General Dynamics Mission Systems which will be 12-month prototyping efforts. This is the first year of RDTE for this program.</p> <p>9. In FY17, OPFOR Integrated Air Defense System (IADS) will award a new standalone contract with a base, plus 4 option year periods.</p> <p>10. In FY16 Medical Training Command and Control (MTC2) development Cost-Plus-Fixed Fee contract awarded to General Dynamics with 3 options for the Medical Simulation Training Centers (MSTC) program. In FY17 MTC2 options exercised, Partial Medical Training Evaluation System (MTES) contract will be exercised.</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 2040 / 5	R-1 Program Element (Number/Name) PE 0604715A / <i>Non-System Training Devices - Eng Dev</i>	Project (Number/Name) 241 / <i>Nstd Combined Arms</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			
OneTESS Program Management	Various	PEO STRI : Orlando, FL	8.046	-		-		-		-		-	0.000	8.046	8.046
OneTESS Program Management	Various	PEO STRI, : Orlando, FL	2.040	-		-		-		-		-	0.000	2.040	2.040
HITS Program Management	Various	PEO STRI : Orlando, FL	0.500	0.300	Nov 2015	0.307	Jan 2017	0.316	Nov 2017	-		0.316	Continuing	Continuing	Continuing
CTC-IS Program Management	Various	PEO STRI : Orlando, FL	5.251	0.974	Nov 2015	1.546	Dec 2016	1.440	Nov 2017	-		1.440	Continuing	Continuing	Continuing
MSTC Program Management	Various	PEO STRI : Orlando, FL	0.455	0.177	Nov 2015	0.167	Mar 2017	0.167	Nov 2017	-		0.167	Continuing	Continuing	Continuing
I-MILES Program Management	Various	PEO STRI : Orlando, FL	0.000	-		0.304	Dec 2016	0.319	Oct 2017	-		0.319	Continuing	Continuing	Continuing
EST Program Management	Various	PEO STRI : Orlando, FL	0.214	-		-		-		-		-	0.000	0.214	0.214
LVC-IA Program Management	Various	PEO STRI : Orlando, FL	5.824	1.181	Nov 2015	1.782	Dec 2016	1.679	Nov 2017	-		1.679	Continuing	Continuing	Continuing
Target Modernization	Various	PEO STRI : Orlando, FL	0.614	-		-		-		-		-	0.000	0.614	0.614
ETC-IS Program Management	Various	PEO STRI : Orlando, FL	0.164	-		-		-		-		-	0.000	0.164	0.164
CTIA	Various	PEO STRI : ORLANDO, FL	0.000	0.364	Oct 2015	0.334	Oct 2016	0.283	Oct 2017	-		0.283	Continuing	Continuing	Continuing
Soldier Fitness Program	TBD	Mulitple : Various	0.000	1.254		0.973		0.892	Jun 2018	-		0.892	0.000	3.119	3.119
Suicide Prevention	TBD	Multiple : Various	0.000	-		-		2.228	Jun 2018	-		2.228	0.000	2.228	2.228
SVT Program Management	Various	PEO STRI : Orlando, FL	0.000	-		-		0.051	Oct 2017	-		0.051	Continuing	Continuing	Continuing
OPFOR Integrated Air Defense System (IADS) Program Management	Various	PEO STRI : Orlando, FL	0.000	-		0.188	Aug 2017	0.554	Oct 2017	-		0.554	Continuing	Continuing	Continuing
Subtotal			23.108	4.250		5.601		7.929		-		7.929	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604715A / Non-System Training Devices - Eng Dev				Project (Number/Name) 241 / Nstd Combined Arms							
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
OneTESS	SS/CPFF	General Dynamics : Fairfax, VA	124.769	-		-		-		-		-	0.000	124.769	124.769
OneTESS	SS/CPFF	General Dynamics C4 Systems : Orlando, FL 32826	10.430	-		-		-		-		-	0.000	10.430	10.430
CTIA	Option/IDIQ	General Dynamics Mission Systems : Orlando, FL	9.371	4.118	May 2016	2.550	Jan 2017	2.910	Jan 2018	-		2.910	Continuing	Continuing	Continuing
CTIA	C/CPFF	Lockheed Martin Inc. : Orlando, FL	57.091	-		-		-		-		-	0.000	57.091	57.091
I-MILES	Option/IDIQ	General Dynamics Mission Systems : Orlando, FL	0.000	-		1.041	Mar 2017	-		-		-	0.000	1.041	1.041
I-MILES RELAVANCY	SS/IDIQ	TBD : TBD	0.000	-		-		2.611	May 2018	-		2.611	Continuing	Continuing	Continuing
CTC-IS	C/IDIQ	General Dynamics Mission Systems : Orlando, FL	32.481	2.665	Mar 2016	2.232	Jan 2017	-		-		-	0.000	37.378	37.041
CTC-IS	C/IDIQ	TBS : TBS	0.000	-		3.322	Jul 2017	3.362	Jul 2018	-		3.362	Continuing	Continuing	Continuing
HITS	C/FFP	Riptide : Orlando, FL	1.379	-		-		-		-		-	0.000	1.379	1.379
HITS	C/IDIQ	General Dynamics Mission Systems : Orlando, FL 32826	1.625	1.484	Jan 2016	-		-		-		-	0.000	3.109	3.109
HITS	Option/IDIQ	General Dynamics Mission Systems (GDMS) : Orlando, FL 32826	0.000	-		1.683	Jan 2017	1.646	Jan 2018	-		1.646	Continuing	Continuing	Continuing
MSTC Development	C/FP	Multiple : Various	3.034	1.405	Sep 2016	0.530	Mar 2017	0.200	Mar 2018	-		0.200	Continuing	Continuing	Continuing
EST Development	C/FP	Cubic Simulation Systems, Inc. : Orlando, FL 32809-3813	1.528	-		-		-		-		-	0.000	1.528	1.528

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017			
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604715A / Non-System Training Devices - Eng Dev				Project (Number/Name) 241 / Nstd Combined Arms							
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
EST	C/FP	Nova Technologies : Panama City, FL 32404-6747	0.609	-		-		-		-		-	0.000	0.609	0.609
EST Enhanced Capabilities	C/FFP	Meggitt Training Systems, Inc. : Suwanee, GA 30024-1247	0.000	1.143	Apr 2016	1.002	Mar 2017	-		-		-	0.000	2.145	2.145
EST Enhanced Capabilities Adaptive Marksmanship and Intelligent Tutoring	C/FFP	Dignitas Technologies : Orlando, FL 32817	0.776	-		-		-		-		-	0.000	0.776	0.776
CFFT Enhanced Joint Fires Observer (JFO) Training and Certification Requirements	C/IDIQ	Nova Technologies : Panama City, FL 32404-6747	0.000	-		1.314	Apr 2017	-		-		-	0.000	1.314	1.314
LVC-IA Development	C/CPFF	Cole Engineering Services, Inc : Orlando, FL	29.822	-		-		-		-		-	0.000	29.822	29.822
LVC-IA Enhanced Capability	C/CPFF	Cole Engineering Services, Inc (CESI) : Orlando, FL	0.000	5.706	Jun 2016	-		-		-		-	0.000	5.706	5.706
LVC-IA Enhanced Capability	Option/CPFF	Cole Engineering Services, Inc (CESI) : Orlando, FL	0.000	-		4.429	Feb 2017	2.762	Nov 2017	-		2.762	Continuing	Continuing	Continuing
Target Modernization	C/IDIQ	Pratt and Miller Engineering : Orlando, FL	4.671	1.929	Nov 2016	-		-		-		-	0.000	6.600	6.600
Target Modernization	Option/IDIQ	Pratt and Miller Engineering (P&M) : Orlando, FL	0.000	-		2.054	Feb 2017	1.000	Feb 2018	-		1.000	Continuing	Continuing	Continuing
Target Modernization	C/CPFF	JRM Enterprises : Fredericksburg, VA	0.000	-		-		1.237	Jul 2018	-		1.237	Continuing	Continuing	Continuing
Congressional Add Center of Excellence for Military	C/FP	Multiple : Various	2.996	-		-		-		-		-	0.000	2.996	2.996

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604715A / <i>Non-System Training Devices - Eng Dev</i>	Project (Number/Name) 241 / <i>Nstd Combined Arms</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			
Operations in Urban Terrain and Cultural Trn															
ETC-IS	SS/CPFF	General Dynamics C4 Systems : Orlando, FL 32826	4.836	-		-		-		-		-	0.000	4.836	4.836
Digital Range Training System (DRTS)	C/FFP	General Dynamics Mission Systems : Orlando, FL	0.000	-		-		1.600	Mar 2018	-		1.600	Continuing	Continuing	Continuing
OPFOR Integrated Air Defense System (IADS)	C/TBD	To Be Determined : Orlando, FL	0.000	-		4.812	Sep 2017	14.346	Jan 2018	-		14.346	Continuing	Continuing	Continuing
Subtotal			285.418	18.450		24.969		31.674		-		31.674	-	-	-

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			
OneTESS	Various	Various : Orlando, FL	6.596	-		-		-		-		-	0.000	6.596	6.596
OneTESS	Various	Various : Various	0.262	-		-		-		-		-	0.000	0.262	0.262
CTIA	Various	Various : Various	12.844	-		-		-		-		-	0.000	12.844	12.844
Target Modernization	Various	Various : Various	0.192	-		-		-		-		-	0.000	0.192	0.192
Subtotal			19.894	-		-		-		-		-	0.000	19.894	19.894

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			
OneTESS Development & Test	Various	Multiple : Orlando, FL	4.162	-		-		-		-		-	0.000	4.162	4.162
OneTESS Test Support	Various	Multiple : Orlando, FL	1.280	-		-		-		-		-	0.000	1.280	1.280
HITS	Various	Various : Orlando, FL	0.740	-		-		-		-		-	0.000	0.740	0.740

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604715A / Non-System Training <i>Devices - Eng Dev</i>	Project (Number/Name) 241 / Nstd Combined Arms
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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			
LVC-IA Test Support	Various	Multiple : Orlando, FL	4.169	1.133	Jun 2016	2.199	Feb 2017	2.372	Nov 2017	-		2.372	Continuing	Continuing	Continuing
IEDES	Various	Multiple : Orlando, FL	0.519	-		-		-		-		-	0.000	0.519	0.519
OPFOR Integrated Air Defense System (IADS)	Various	Multiple : Orlando, FL	0.000	-		-		1.600	Jul 2018	-		1.600	Continuing	Continuing	Continuing
Subtotal			10.870	1.133		2.199		3.972		-		3.972	-	-	-
Project Cost Totals			339.290	23.833		32.769		43.575		-		43.575	-	-	-

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604715A / <i>Non-System Training Devices - Eng Dev</i>	Project (Number/Name) 241 / <i>Nstd Combined Arms</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
	CTIA Development and Architectural Evolution	[Redacted]																										
CTC IS Development	[Redacted]																											
I-MILES Development	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
I-MILES RELAVANCY	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
HITS Development	[Redacted]																											
MSTC MT-C2 Development	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
MSTC Trainer Developments	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
EST Enhanced Capabilities Adaptive Marksmanship and Intelligent Tutoring	[Redacted]		[Redacted]		[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
EST Enhanced Capabilities	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
CFFT Enhanced Joint Fires Observer (JFO) Training and Certification Requirements	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
LVC-IA - Version 2 (Development, Integration, Demonstration and Testing)	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
LVC-IA - Version 3 (Development, Integration, Demonstration and Testing)	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
LVC-IA - Version 4 (Development, Integration, Demonstration and Testing)	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604715A / <i>Non-System Training Devices - Eng Dev</i>	Project (Number/Name) 241 / <i>Nstd Combined Arms</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
Target Modernization Development																												
CSF2																												
SVT - Development																												
Digital Range Training System (DRTS)																												
OPFOR Integrated Air Defense System (IADS)																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604715A / <i>Non-System Training Devices - Eng Dev</i>	Project (Number/Name) 241 / <i>Nstd Combined Arms</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CTIA Development and Architectural Evolution	1	2012	4	2023
CTC IS Development	1	2010	4	2022
I-MILES Development	2	2017	2	2018
I-MILES RELAVANCY	2	2018	4	2022
HITS Development	3	2012	4	2023
MSTC MT-C2 Development	2	2016	1	2018
MSTC Trainer Developments	2	2017	4	2021
EST Enhanced Capabilities Adaptive Marksmanship and Intelligent Tutoring	3	2015	2	2016
EST Enhanced Capabilities	3	2016	2	2018
CFFT Enhanced Joint Fires Observer (JFO) Training and Certification Requirements	2	2017	3	2018
LVC-IA - Version 2 (Development, Integration, Demonstration and Testing)	1	2014	3	2016
LVC-IA - Version 3 (Development, Integration, Demonstration and Testing)	4	2016	3	2018
LVC-IA - Version 4 (Development, Integration, Demonstration and Testing)	4	2018	2	2020
Target Modernization Development	1	2016	4	2022
CSF2	1	2015	4	2016
SVT - Development	3	2018	4	2021
Digital Range Training System (DRTS)	2	2018	4	2019
OPFOR Integrated Air Defense System (IADS)	4	2017	4	2021

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604715A / Non-System Training Devices - Eng Dev				Project (Number/Name) 573 / Program Executive Office Simulation, Training Spt			
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
573: Program Executive Office Simulation, Training Spt	-	2.935	3.038	0.000	-	0.000	0.148	0.140	0.139	0.000	0.000	6.400
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

A. Mission Description and Budget Item Justification

In support of Non-System Training Devices (NSTD), this project funds the US Army Program Executive Officer Simulation, Training and Instrumentation (PEO STRI) core operations supporting development of Army training devices and simulations by PEO STRI project managers (PM TRADE, PM ITTS, and PM ITE).

FY 2018, per Program Decision Memorandum (PDM) directed Major Army Headquarters Realignment, is the first year that realigns Government authorizations and associated funding to an Army Management Headquarter Account (AMHA), which zeroed out the funding in FY 2018.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Government Program Management to support PEO STRI.	2.935	3.038	-	-	-
Description: Government Program Management to support PEO STRI.					
FY 2016 Accomplishments: Government Program Management supported PEO STRI labor for project managers in PM TRADE, PM ITTS, and PM ITE.					
FY 2017 Plans: Government Program Management to support PEO STRI labor for project managers in PM TRADE, PM ITTS, and PM ITE.					
Accomplishments/Planned Programs Subtotals	2.935	3.038	-	-	-

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 / 5	R-1 Program Element (Number/Name) PE 0604715A / Non-System Training Devices - Eng Dev	Project (Number/Name) 573 / Program Executive Office Simulation, Training Spt

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 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng 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	-	33.619	205.432	28.726	-	28.726	28.320	14.638	8.674	0.000	Continuing	Continuing
126: PEO Electronic Protect	-	0.000	17.076	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
146: Air & Msl Defense Planning Control Sys	-	15.157	23.761	24.306	-	24.306	24.588	14.466	8.500	0.000	Continuing	Continuing
149: Counter-Rockets, Artillery & Mortar	-	18.462	20.695	4.420	-	4.420	3.732	0.172	0.174	0.000	Continuing	Continuing
FG5: Counter Unmanned Aerial Systems (CUAS)	-	0.000	143.900	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	143.900

Note

Project 126: In FY 2018 funds transitioned from PE 0604741A, Project 126 to PE 0603327A Project FG9.

A. Mission Description and Budget Item Justification

The Advanced Electronic Protection Enhancement (AEPE) Program funds efforts to assess and initiate development of solutions to Army Air and Missile Defense (AMD) vulnerabilities from Advanced Electronic Attack (AEA). Army AMD sensors, Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS) Command and Control (C2), and Radio Frequency (RF) data and voice networks will be assessed against current and postulated AEA systems and techniques. Potential Electronic Protection (EP) solutions developed by the Army will be demonstrated and assessed in live and simulated AEA environments. Similarly, EP solutions developed by the Joint services and other Agencies (e.g., the Missile Defense Agency) will also be assessed for potential incorporation into Army AMD systems.

The Air and Missile Defense Planning and Control System (AMDPCS) is an Army Objective Force System that provides integration of Air and Missile Defense (AMD) operations at all echelons. AMDPCS systems are deployed with Air Defense Artillery (ADA) brigades, Army Air and Missile Defense Commands (AAMDCs), and Air Defense and Airspace Management (ADAM) Cells at the Brigade Combat Teams (BCT's), Multi Functional Support Brigades and Divisions/Corps. AMDPCS systems also provide air defense capabilities to Homeland Defense systems. ADAM Cells provide the Commander at BCTs, Brigades and Divisions with air defense situational awareness and airspace management capabilities. They also provide the interoperability link with Joint, multinational and coalition forces. AMDPCS components are vital in the transformation of ADA units and the activation of the Air & Missile Defense (AMD) Battalions. AMDPCS has three major components: (1) The Air and Missile Defense Workstation (AMDWS) is an automated defense and staff planning tool that displays the common tactical and operational 3-dimensional air picture. AMDWS is the air picture provider for the Army, producing an integrated and correlated air picture at all tactical levels and locations. AMDWS is also an integral component of Integrated Base Defense. AMDWS provides an interoperability link to multinational air defense forces; (2) The Air Defense System Integrator (ADSI) is a communications data link processor and display system that provides near-real time, 3-dimensional, joint airspace situational awareness and fire direction command and control for AMD forces; (3) The Army Air Defense shelter configurations use automated data processing equipment, tactical communications, Common Hardware Systems, standard vehicles and tactical power to provide AMD unit commanders and staffs with the capabilities to plan missions, direct forces, and control airspace.

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604741A / <i>Air Defense Command, Control and Intelligence - Eng Dev</i>
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The integration of the Cooperative Aircraft Surveillance Sensor (CASS) into sheltered systems enables AMDPCS to track self-reporting aircraft. CASS receives position and identification data from self-reporting aircraft, to include UAS, within 250 nautical miles.

The Counter-Rocket, Artillery, Mortar (C-RAM) system-of-systems (SoS) is an evolutionary, non-developmental program that detects RAM launches; provides localized warning to the defended area, with sufficient time for personnel to take appropriate action; intercepts rounds in flight, thus preventing damage to ground forces or facilities; and enhances response to and defeat of enemy forces. The C-RAM capability is comprised of a combination of multi-service fielded and non-developmental item (NDI) sensors, command and control (C2) equipment, a commercial industry-produced warning system, and a modified U.S. Navy intercept system (Land-based Phalanx Weapon System (LPWS)), all connected via a wireless local area network. The Forward Area Air Defense Command and Control (FAAD C2) system, also under the management of the C-RAM Program Directorate, provides the C-RAM C2 functionality and has been enhanced to integrate the sensors, weapons, and warning systems for the C-RAM SoS. C-RAM C2 software correlates RAM sensor data, evaluates the threat, provides early warning, directs engagements, and cues counterfire systems and reaction forces. The C-RAM SoS capability is currently deployed at multiple sites in Afghanistan, Iraq, and Egypt, providing correlated air and ground pictures to the Army Mission Command and the Joint Defense Networks, and using various forms of communications to provide situational awareness and exchange of timely and accurate information to synchronize and optimize automated Shape, Sense, Warn, Intercept, Respond, and Protect decisions.

Multiple acquisition efforts are associated with the C-RAM program, including C-RAM Intercept, which fields existing LPWS guns to two Indirect Fire Protection Capability (IFPC)/Avenger composite Battalions, and RAM Warn, a horizontal technology insertion, using current C-RAM warning capability to provide early, localized warning to all Maneuver Brigade Combat Teams (BCT).

The Counter-Unmanned Aerial Systems (C-UAS) capability is being developed in response to a Joint Operational Needs Statement (JUONS) CC-0558 approved by Joint Rapid Acquisition Cell (JRAC) in June 2016. Project FG5 was created to support the identification, development, testing, evaluation and integration of technologies to provide an overall evolutionary capability to defeat small Unmanned Aerial Systems (UAS) threats. The C-UAS system will provide the capability for the warfighter to comprehensively detect, identify and defeat enemy Group 1 and 2 light weight, low altitude UAS. The C-UAS system development involves a phased development and testing approach of Counter UAS Systems.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	34.569	53.332	25.950	-	25.950
Current President's Budget	33.619	205.432	28.726	-	28.726
Total Adjustments	-0.950	152.100	2.776	-	2.776
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.950	-			
• Adjustments to Budget Years	0.000	152.100	2.776	-	2.776

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604741A / <i>Air Defense Command, Control and Intelligence - Eng Dev</i>
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Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: 149: *Counter-Rockets, Artillery & Mortar*

Congressional Add: *C-RAM Capability Enhancement - Network Security Enhancements*

Congressional Add Subtotals for Project: 149

Congressional Add Totals for all Projects

	FY 2016	FY 2017
	10.000	-
	10.000	-
	10.000	-

Change Summary Explanation

FY 2017 funding adjustment of \$152.100 million includes an \$8.200 million increase for CASS system engineering (includes cyber, data at rest, and a new IFF Response Processor (IRP) Card design), as well as a \$143.900 million amended budget add to support C-UAS JUONS CC-0558 efforts to address incremental improvements to deployed capability as informed by test events at each phase. Additionally funds C-UAS to develop and test kinetic kill defeat options for integration into the Low-slow-small UAS Integrated Defeat System.

The FY 2018 funding adjustment of \$2.776 million includes an increase of \$8.200 to support CASS system engineering (includes cyber, data at rest, and a new IFF Response Processor (IRP) Card design), as well as decrease in the amount of (\$5.809) million due to the realignment of Advanced Electronic Protection Enhancements (AEPE) funds beginning FY18 from PE 0604741A (Project 126) to PE 0603327A (Project FG9, Air and Missile Defense Electronic Warfare).

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev				Project (Number/Name) 126 / PEO Electronic Protect			
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
126: PEO Electronic Protect	-	0.000	17.076	0.000	-	0.000	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY2018, Advanced Electronic Protection Enhancements (AEPE) funds have been realigned from PE 0604741A (Project 126) to PE 0603327A (Project FG9, Air and Missile Defense Electronic Warfare).

A. Mission Description and Budget Item Justification

The Advanced Electronic Protection Enhancement (AEPE) Program funds efforts to assess and initiate development of solutions to Army Air and Missile Defense (AMD) vulnerabilities from Advanced Electronic Attack (AEA). Army AMD sensors, Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS) Command and Control (C2), and Radio Frequency (RF) data and voice networks will be assessed against current and postulated AEA systems and techniques. Potential Electronic Protection (EP) solutions developed by the Army will be demonstrated and assessed in live and simulated AEA environments. Similarly, EP solutions developed by the Joint services and other Agencies (e.g., the Missile Defense Agency) will also be assessed for potential incorporation into Army AMD systems.

The initial assessment event was conducted in 2QFY15. Subsequent events will be conducted approximately every two (2) years. Analysis and implementation that provide AEA solutions will occur between events and will be assessed at the next event after implementation.

The following tasks were developed based on previous AEPE demonstration results and the following planned activities will assess the AEA impacts on AMD components and development of countermeasures. The tasks for AEPE are: (1) Plan and execute periodic AEPE demonstrations with Army AMD systems and perform post-demonstration analysis. Integrate Joint service and other Agency AMD systems into AEPE demonstrations as appropriate. (2) Upon completion of AEPE demonstration analyses, create EP concepts to mitigate Army AMD sensor, C2, and RF data link vulnerabilities. (3) Develop EP tools for use by Army AMD systems to improve overall system performance in AEA environments. (4) Develop effects-based AEA Modeling and Simulation (M&S) to assess Army AMD EP concepts in Hardware-In-The-Loop (HWIL) environment. (5) Continue to collaborate 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. Evaluate and modify applicable Joint EP TTPs for use in Army AMD systems. (6) Continually interface with intelligence communities to maintain cognizance of emerging AEA threats and incorporate these threats in future AEPE demonstrations. (7) Develop a time-phased EP roadmap that identifies the investments needed to improve the EP capabilities of Army AMD sensors, C2, and RF data and voice networks.

The AEPE effort crosses all AMD System efforts of which only a portion is Air Defense Command and Control.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Advanced Electronic Protection Enhancements	-	17.076	-	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / <i>Air Defense Command, Control and Intelligence - Eng Dev</i>	Project (Number/Name) 126 / <i>PEO Electronic Protect</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Description: Funding is provided for conduct of AEPE planning efforts, conduct of demonstrations and post-mission analysis.					
FY 2017 Plans: Funding is provided for conduct of AEPE planning efforts, conduct of demonstrations and post-mission analysis.					
Accomplishments/Planned Programs Subtotals	-	17.076	-	-	-

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

N/A

Remarks

Not applicable for this item.

D. Acquisition Strategy

Not applicable for this item.

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 / 5					R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev				Project (Number/Name) 146 / Air & Msl Defense Planning Control Sys			
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
146: Air & Msl Defense Planning Control Sys	-	15.157	23.761	24.306	-	24.306	24.588	14.466	8.500	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Air and Missile Defense Planning and Control System (AMDPCS) is an Army Objective Force System that provides integration of Air and Missile Defense (AMD) operations at all echelons. AMDPCS systems are deployed with Air Defense Artillery (ADA) brigades, Army Air and Missile Defense Commands (AAMDCs), and Air Defense and Airspace Management (ADAM) Cells at the Brigade Combat Teams (BCT's), Multi Functional Support Brigades and Divisions/Corps. AMDPCS systems also provide air defense capabilities to Homeland Defense systems. ADAM Cells provide the Commander at BCTs, Brigades and Divisions with air defense situational awareness and airspace management capabilities. They also provide the interoperability link with Joint, multinational and coalition forces. AMDPCS components are vital in the transformation of ADA units and the activation of the AMD Battalions. AMDPCS has three major components: (1) The Air and Missile Defense Workstation (AMDWS) is an automated defense and staff planning tool that displays the common tactical and operational three dimensional air picture. AMDWS is the air picture provider for the Army, producing an integrated and correlated air picture at all tactical levels and locations. AMDWS is also an integral component of Integrated Base Defense. AMDWS provides an interoperability link to multinational air defense forces; (2) The Air Defense System Integrator (ADSI) is joint data link communications processor and display system that provides near-real time, three dimensional, joint airspace situational awareness and fire direction command and control for AMD forces; (3) The Army Air Defense shelter configurations use automated data processing equipment, tactical communications, Common Hardware Systems, standard vehicles and tactical power to provide AMD unit commanders and staffs with the capabilities to plan missions, direct forces, and control airspace. The integration of the Cooperative Aircraft Surveillance Sensor (CASS) into sheltered systems enables AMDPCS to track self-reporting aircraft. CASS receives position and identification data from self-reporting aircraft, to include UAS, within 250 nautical miles.

FY18 funds the development, software engineering, testing and certification of AMDWS and CASS software; Engineering, development, test and evaluation of the AMDPCS Family of Shelter (FoS) subsystems; and Software system certification testing, accreditation, and approval of authority-to-operate (ATO).

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: AMDWS Software Development	11.520	12.332	13.295	-	13.295
Description: AMDWS development and support of LandWarNet as well as various Common Operating Environments (COEs). AMDWS software engineering and development are consistent with COE requirements, evolving the air and missile defense planning and control requirements to a net-centric environment, and fulfilling the air defense force operations capabilities identified in the AMD TRADOC capabilities requirement list. Virtualize AMDWS software development and rehost onto COE Real-Time Computing Environment common					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev	Project (Number/Name) 146 / Air & Msl Defense Planning Control Sys

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
hardware systems. Support the evolving development of the Force Operations portion of the Integrated Air and Missile Defense (IAMD) System of Systems.					
<p>FY 2016 Accomplishments: Began AMDWS software engineering consistent with Capability Set 17-18 / COE v3 requirements. Supported test of COE product. Worked user requirements from 32nd, 94th, and 10th AAMDCs and ADA Brigades.</p> <p>FY 2017 Plans: Completed AMDWS software engineering consistent with Capability Set 17-18 / COE v3 requirements. Integrated COE AMDWS version, which is the initial Server-client Capability. Integrated the COE AMDWS with the ADAM. Updated Air Force interfaces.</p> <p>FY 2018 Base Plans: Continue AMDWS software engineering consistent with Capability Set 17-18 / COE v3 requirements. Integrate COE AMDWS version, which is the initial Server-client Capability. Integrate the COE AMDWS with the ADAM. Implement interface to the Cooperative Aircraft Surveillance System (CASS) in support of commercial aircraft de-confliction.</p>					
<p>Title: Cooperative Aircraft Surveillance Sensor (CASS)</p> <p>Description: CASS receives position and identification data from self-reporting aircraft, to include UAS, within 250 nautical miles.</p> <p>FY 2017 Plans: Began system engineering which includes cyber, data at rest, and a new IFF Response Processor (IRP) Card design. This non-recurring engineering effort supports the development of the fielded product for the AMDPCS and Integrated Air and Missile Defense Battle Command Systems (IBCS). CASS components such as the IRP Card will be used to resolve obsolescence issues on the TPX family of Identification Friend or Foe (IFF) interrogators fielded with Patriot, Sentinel, and Air Traffic Navigation and Control Systems (ATNAVICS).</p> <p>FY 2018 Base Plans: Continue system engineering which includes cyber, data at rest, and a new IFF Response Processor (IRP) Card design. This non-recurring engineering effort will support the development of the fielded product for the AMDPCS and Integrated Air and Missile Defense Battle Command Systems (IBCS). CASS components such</p>	-	8.200	8.200	-	8.200

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev	Project (Number/Name) 146 / Air & Msl Defense Planning Control Sys

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
as the IRP Card will be used to resolve obsolescence issues on the TPX family of Identification Friend or Foe (IFF) interrogators fielded with Patriot, Sentinel, and Air Traffic Navigation and Control Systems (ATNAVICS).					
<p>Title: ADSI Software Engineering and Development</p> <p>Description: ADSI software engineering and development of next software baseline (post-v15.0.4), including testing and certification of capabilities for TacView Situational Awareness, with air control support, scenario generation and three dimensional display across various tactical data links. Version 15.0.4 software upgrades the ADSI OS to use Windows 7 and Red Hat Linux. FY17 completes ADSI version 15.0.4 software development and test activities, including certification.</p> <p>FY 2016 Accomplishments: Continued development of ADSI version 15.0.4 software.</p> <p>FY 2017 Plans: Completed ADSI version 15.0.4 software development. Completed version 15.0.4 test activities, including certification.</p>	0.758	0.516	-	-	-
<p>Title: Engineering, Development, Test and Evaluation</p> <p>Description: Engineering, development, test, and evaluation of the AMDPCS Family of Shelter (FoS) subsystems objective configuration; evaluation and finalization of the AMDPCS tactical communications, data processing and vehicle/shelter/power generation/environmental system block upgrade program for fielded systems.</p> <p>FY 2016 Accomplishments: Continued evaluation of emerging technologies for future application in AMDPCS. Supported IBCS-ADAM COE configurations at NIE 16.1 and 16.2. Continued to work closely with PM IAMD to identify the ADAM cell configuration to support IBCS Fire Control Network (FCN).</p> <p>FY 2017 Plans: Continued evaluations of emerging technologies. Continued support of IBCS-ADAM COE configurations and CASS evaluations at NIE 17.1 and 17.2.</p> <p>FY 2018 Base Plans:</p>	1.970	1.856	1.918	-	1.918

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev	Project (Number/Name) 146 / Air & Msl Defense Planning Control Sys
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continue evaluations of emerging technologies and obsolescence. Continue support and development of IBCS-ADAM COE configurations and CASS integration/testing at NIE 18.1, 18.2, 19.1 and 19.2.					
<p>Title: Software System Certification Testing, Accreditation, and Approval of Authority-to-Operate (ATO)</p> <p>Description: Software system certification testing, accreditation, and approval of ATOs for the various software systems, pursuit of approval of the Host Based Security System (HBSS), SolidCore or other authorized / approved G6 software; Army and Joint integration and interoperability assessments.</p> <p>FY 2016 Accomplishments: Continued software systems certification testing, accreditation, and approval of ATOs as required by the DOD Risk Management Framework process. Continued Army and Joint integration and interoperability assessments.</p> <p>FY 2017 Plans: Continued software systems certification testing, accreditation, and approval of ATOs as required by the DOD Risk Management Framework process. Continued Army and Joint integration and interoperability assessments.</p> <p>FY 2018 Base Plans: Continue software systems certification testing, accreditation, and approval of ATOs as required by the DOD Risk Management Framework process. Continue Army and Joint integration and interoperability assessments.</p>	0.909	0.857	0.893	-	0.893
Accomplishments/Planned Programs Subtotals	15.157	23.761	24.306	-	24.306

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
• AD5070: AD5070, AMDPCS	28.176	126.539	26.635	9.100	35.735	17.960	6.366	32.397	-	Continuing	Continuing
• PE 0604741A, Proj 149: PE 0604741A, Proj 149, Counter-Rockets, Artillery & Mortar	18.462	20.695	4.420	-	4.420	3.732	0.172	0.174	-	Continuing	Continuing
• SSN H30503: SSN H30503, Rocket, Artillery, Mortar (RAM) Warn (Parent is IFPC Family of Systems: BZ0501)	42.458	29.680	11.380	-	11.380	3.470	-	0.712	-	0	87.700

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev	Project (Number/Name) 146 / Air & Msl Defense Planning Control Sys
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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>
• SSN H30504: SSN H30504, C-RAM Enhancements (Parent is IFPC Family of Systems: BZ0501)	18.221	62.687	-	-	-	12.237	-	-	-	0	93.145
• PE 06043019A, Proj DU3: PE 06043019A, Proj DU3, IFPC (FY12 PE0603305A IFPC II - Intercept)	149.222	-	31.303	-	31.303	52.604	239.305	259.804	316.104	Continuing	Continuing
• SSN BZ5075: SSN BZ5075, IAMD Battle Command System	20.917	204.969	-	-	-	-	326.928	387.026	513.464	Continuing	Continuing
• PE 060482A, Proj E10: PE 0604820A, Proj E10, Sentinel	11.821	15.983	32.968	-	32.968	31.761	51.897	72.562	81.351	Continuing	Continuing
• PE 0604741A, Proj FG5: PE 0604741A, Proj FG5, Counter Unmanned Aerial Systems (C-UAS)	-	143.900	-	-	-	-	-	-	-	0	143.900
• SSN H30505: SSN H30505, Counter Unmanned Aerial Systems (C-UAS)	-	174.640	10.000	57.500	67.500	-	-	-	-	0	242.140

Remarks

This program is an integral part of the Army Integrated Air and Missile Defense (IAMD) architecture.

D. Acquisition Strategy

The acquisition strategy relies on non-development items (NDI) and evolutionary software development to rapidly meet the demands of air defense battle management command, control, communications, computers, and intelligence (BM/C4I) requirements and to keep pace with automated information technologies. The concept of evolutionary software development will be accomplished in a series of AMDWS Block releases and upgrades. AMDPCS is being developed for both the Army's Active and Reserve components.

AMDWS software development is contracted Sole Source (SS)/Cost Plus Fixed Fee (CPFF) to Northrop Grumman. CASS development will be competitively awarded.

AMDWS is a prime component of C-RAM. It provides the Forward Operating Base (FOB) commander with clearance of fires display and enemy munitions flight paths.

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 / 5	R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev	Project (Number/Name) 146 / Air & Msl Defense Planning Control Sys
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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 Administration	Various	Various : Various	28.131	1.683	Dec 2015	1.811	Dec 2016	1.823	Dec 2017	-		1.823	Continuing	Continuing	Continuing
Subtotal			28.131	1.683		1.811		1.823		-		1.823	-	-	-

Remarks
Not Applicable

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			
AMDWS Software Development and Engineering	SS/CPFF	Northrop Grumman : Huntsville AL	120.755	11.281	Oct 2015	11.828	Oct 2016	12.153	Oct 2017	-		12.153	Continuing	Continuing	Continuing
CASS Development Engineering	C/TBD	Raytheon : Aberdeen Proving Ground, MD	0.000	-		6.696	May 2017	6.806	Jan 2018	-		6.806	Continuing	Continuing	Continuing
ADSI Software Development and Engineering	SS/T&M	Ultra Electronics : Austin, TX	6.731	0.080	Feb 2016	0.076	Feb 2017	-		-		-	0.000	6.887	0.000
Developmental Engineering	Various	Various : Various	37.550	1.986	Dec 2015	3.089	Dec 2016	3.160	Dec 2017	-		3.160	Continuing	Continuing	Continuing
Subtotal			165.036	13.347		21.689		22.119		-		22.119	-	-	-

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			
Certification/Testing	Various	JITC : Ft Huachuca, AZ	1.074	0.053	Feb 2016	0.119	Feb 2017	0.170	Feb 2018	-		0.170	Continuing	Continuing	Continuing
Interoperability Assessment	Various	CTSF : Ft Hood, TX	1.412	0.074	May 2016	0.142	May 2017	0.194	May 2018	-		0.194	Continuing	Continuing	Continuing
Subtotal			2.486	0.127		0.261		0.364		-		0.364	-	-	-

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army							Date: May 2017				
Appropriation/Budget Activity 2040 / 5			R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev				Project (Number/Name) 146 / Air & Msl Defense Planning Control Sys				
	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	195.653	15.157	23.761	24.306	-	24.306	-	-	-		

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev	Project (Number/Name) 146 / Air & Msl Defense Planning Control Sys
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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
AMDWS Block IV Contract (FY11-FY16), BLK V Contract (FY16- FY21)	AMDWS Block IV / AMDWS Block V Contract																											
AMDWS Software Block Development, Testing, Certification	AMDWS Software Block Testing (Includes Intra-Army Interoperability Cert)																											
AMDWS Capability Set (CS) and COE Development / Test	AMDWS CS & COE Development & Test																											
AMDWS AMD Interfaces: C2BMC, C2IS, C2AOS, AOC WS, etc	C2BMC, C2IS, C2AOS, AOC WS, Patriot, IBCS, THAAD, C-RAM, C2, TBMCS, COE, ABCS																											
Cooperative Aircraft Surveillance Sensor (CASS) Engineering/Integration	CASS Engineering / Integration																											
ADSI Software Engineering Development and Test	ADSI SW Eng Dev, Interoperability Cert Testing																											
AWA 16.1 (COE ADAM) DOTMLPF Eval / NIE 16.2	16.1 / 16.2																											
Army Warfighting Assessment (AWA) 17.1 / NIE 17.2					17.1 / 17.2																							
AWA 18.1 / Network Integration Evaluation (NIE) 18.2									18.1 / 18.2																			
AWA 19.1 / NIE 19.2													19.1 / 19.2															
AWA 20.1 / NIE 20.2																	20.1 / 20.2											
AWA 21.1 / NIE 21.2																					21.1 / 21.2							
AWA 22.1																									22.1			

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / <i>Air Defense Command, Control and Intelligence - Eng Dev</i>	Project (Number/Name) 146 / <i>Air & Msl Defense Planning Control Sys</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AMDWS Block IV Contract (FY11-FY16), BLK V Contract (FY16- FY21)	2	2011	4	2021
AMDWS Software Block Development, Testing, Certification	3	2007	4	2021
AMDWS Capability Set (CS) and COE Development / Test	1	2013	4	2021
AMDWS AMD Interfaces: C2BMC, C2IS, C2AOS, AOC WS, etc	4	2012	4	2021
Cooperative Aircraft Surveillance Sensor (CASS) Engineering/Integration	3	2017	4	2019
ADSI Software Engineering Development and Test	1	2005	4	2017
AWA 16.1 (COE ADAM) DOTMLPF Eval / NIE 16.2	4	2015	3	2016
Army Warfighting Assessment (AWA) 17.1 / NIE 17.2	4	2016	3	2017
AWA 18.1 / Network Integration Evaluation (NIE) 18.2	4	2017	3	2018
AWA 19.1 / NIE 19.2	4	2018	3	2019
AWA 20.1 / NIE 20.2	4	2019	3	2020
AWA 21.1 / NIE 21.2	4	2020	3	2021
AWA 22.1	4	2021	4	2021

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604741A / <i>Air Defense Command, Control and Intelligence - Eng Dev</i>				Project (Number/Name) 149 / <i>Counter-Rockets, Artillery & Mortar</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
149: <i>Counter-Rockets, Artillery & Mortar</i>	-	18.462	20.695	4.420	-	4.420	3.732	0.172	0.174	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Counter-Rocket, Artillery, Mortar (C-RAM) system-of-systems (SoS) is an evolutionary, non-developmental program that detects RAM launches; provides localized warning to the defended area, with sufficient time for personnel to take appropriate action; intercepts rounds in flight, thus preventing damage to ground forces or facilities; and enhances response to and defeat of enemy forces. The C-RAM capability is comprised of a combination of multi-service fielded and non-developmental item (NDI) sensors, command and control (C2) equipment, a commercial industry-produced warning system, and a modified U.S. Navy intercept system (Land-based Phalanx Weapon System (LPWS)), all connected via a wireless local area network. The Forward Area Air Defense Command and Control (FAAD C2) system, also under the management of the C-RAM Program Directorate, provides the C-RAM C2 functionality and has been enhanced to integrate the sensors, weapons, and warning systems for the C-RAM SoS. C-RAM C2 software correlates RAM sensor data, evaluates the threat, provides early warning, directs engagements, and cues counterfire systems and reaction forces. The C-RAM SoS capability is currently deployed at multiple sites in Afghanistan, Iraq, and Egypt, providing correlated air and ground pictures to the Army Mission Command and the Joint Defense Networks, and using various forms of communications to provide situational awareness and exchange of timely and accurate information to synchronize and optimize automated Shape, Sense, Warn, Intercept, Respond, and Protect decisions.

The deployment of the C-RAM SoS was accomplished through an incremental acquisition process driven by urgent operational needs, theater priorities, and emerging capability requirements to provide a counter-RAM capability to combat forces. The C-RAM SoS approach was initially validated by a Proof of Principle demonstration in December 2004 and has undergone more than 25 Army Test and Evaluation Command (ATEC)-supported operational assessments to incorporate multiple improvements in response to changes in threat tactics and lessons learned. C-RAM capabilities are currently deployed to locations in support of Operation Freedom's Sentinel (OFS), Operation Inherent Resolve (OIR), and Task Force Sinai (TFS). Continuing C-RAM SoS improvement efforts, required to meet emerging theater requirements, include C2 and LPWS software upgrades as well as integration and deployment of Ku band Radio Frequency System (KuRFS) radars for an enhanced detection capability against stressing threats. Base RDTE funding for FY 2015 and beyond supports maintenance of C-RAM C2 basic Air Defense functionality. Support of the existing C-RAM SoS capability deployed in theater has been through the Overseas Contingency Operations (OCO) process.

Recent directed enhancements to the C-RAM SoS capability included use of Army tactical communications rather than commercial systems; integration of Warn functionality into the C2 workstation to reduce complexity and footprint; and integration with Unmanned Aircraft Systems (UAS) Universal Ground Control Station (UGCS) for enhanced situational awareness, combat identification, and response options. FY16-17 enhancements include testing and upgrade of dynamic clearance of unplanned fires (DCUF) in conjunction with the Advanced Field Artillery Tactical Data System (AFATDS) V2 for rapid and enhanced response, integration of sensor communications and legacy systems, development and integration of C-RAM network security enhancements, and completion of an LPWS cruise missile capability study and modification development effort.

FY 2018 Base RDT&E dollars in the amount of \$4.420 million provide C-RAM C2 development and upgrades.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / <i>Air Defense Command, Control and Intelligence - Eng Dev</i>	Project (Number/Name) 149 / <i>Counter-Rockets, Artillery & Mortar</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Title: C-RAM C2 Software Development and Enhancements</p> <p>Description: Funds system-of-systems development and upgrades based on changes in threat, integration of emerging requirements from external PMs (Mission Command) and other Services/agencies, technology insertions (IP-based communications), and interoperability requirements (Joint interoperability, MIL Standard), and provides development and regression testing to ensure C-RAM C2 enhancements do not negatively impact the performance of the other C-RAM pillars (Shape, Sense, Warn, Intercept, Respond, and Protect). Includes Host Based Security System (HBSS)/SolidCore (Information Assurance compliance).</p> <p>FY 2016 Accomplishments: Completed integration into C-RAM architecture for demonstration of MML capability. Incorporated LPWS advanced battle management upgrades, supported C-RAM C2 v5.5C Materiel Release, and initiated C-RAM convergence with Integrated Air and Missile Defense (IAMD). Initiated C-RAM C2 v5.6 software development.</p> <p>FY 2017 Plans: Enable C-UAS electronic and kinetic defeat interoperability, expand coalition communications, and perform Integrated Air and Missile Defense (IAMD) convergence systems engineering.</p> <p>FY 2018 Base Plans: Test and validate C-UAS interoperability requirements, implement IAMD convergence, and incorporate cyber security updates.</p>	4.377	4.465	4.420	-	4.420
<p>Title: Dynamic Clearance of Unplanned Fires (DCUF)</p> <p>Description: Software enhancement within C-RAM C2 that provides automated airspace assessments to the Advanced Field Artillery Tactical Data System (AFATDS), enabling safer and more rapid clearance of artillery fires at the Brigade level. DCUF enables more effective engagements of unplanned targets, while reducing the risk of aerial fratricide in the prosecution of fire missions.</p> <p>FY 2016 Accomplishments: Funded DCUF participation within the Maneuver Fires Integration Experiment (MFI) for the purpose of demonstrating the effectiveness of the DCUF contribution to the BCT warfight and informing the TRADOC requirements generation process.</p> <p>FY 2017 Plans:</p>	4.085	6.701	-	-	-

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev	Project (Number/Name) 149 / Counter-Rockets, Artillery & Mortar
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Complete DCUF software development and Materiel Release activities based on the DCUF requirements established during FY16.					
Title: C-RAM Capability Enhancement - LPWS Cruise Missile Capability Study Description: Funds capability enhancements to increase the overall effectiveness of the C-RAM system-of-systems through completion of an LPWS cruise missile capability study and modification development efforts. FY 2017 Plans: Complete LPWS cruise missile capability study and modification development efforts.	-	9.529	-	-	-
Accomplishments/Planned Programs Subtotals	8.462	20.695	4.420	-	4.420

	FY 2016	FY 2017
Congressional Add: C-RAM Capability Enhancement - Network Security Enhancements FY 2016 Accomplishments: Integrated sensor communications and legacy systems. Developed and integrated C-RAM network security enhancements.	10.000	-
Congressional Adds Subtotals	10.000	-

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
• SSN H30503: SSN H30503, Rocket, Artillery, Mortar (RAM) Warn (Parent is IFPC Family of Systems: BZ0501)	42.458	29.680	11.380	-	11.380	3.470	-	0.712	-	0.000	87.700
• SSN H30504: SSN H30504, C-RAM Enhancements (Parent is IFPC Family of Systems: BZ0501)	18.221	62.687	-	-	-	12.237	-	-	-	0.000	93.145
• PE 0604741A, Proj 146: PE 0604741A, Proj 146, Air & Missile Defense Planning and Control System	15.157	23.761	24.306	-	24.306	24.588	14.466	8.500	-	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017	
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev				Project (Number/Name) 149 / Counter-Rockets, Artillery & Mortar			

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
• SSN AD5070: SSN AD5070, Air & Missile Defense Planning and Control System	28.176	126.539	26.635	9.100	35.735	17.960	6.366	32.397	-	Continuing	Continuing
• PE 0604319A, Proj DU3: PE 0604319A, Proj DU3, IFPC2 (FY12 PE0603305A IFPC II - Intercept)	149.222	-	11.303	-	11.303	52.604	239.305	259.804	316.104	Continuing	Continuing
• PE 0605457A, Proj S40: PE 0605457A, Proj S40, Army Integrated Air and Missile Defense (AIAMD)	222.074	272.811	336.420	-	336.420	290.250	190.600	117.470	64.510	Continuing	Continuing
• SSN BZ5075: SSN BZ5075, IAMD Battle Command System	20.917	204.969	-	-	-	-	326.928	387.026	513.464	Continuing	Continuing
• PE 060482A, Proj E10: PE 060482A, Proj E10, Sentinel	11.821	15.983	32.968	-	32.968	31.761	51.897	72.562	81.351	Continuing	Continuing
• PE 0604823A, Proj L86: PE 0604823A, Proj L86, Lightweight Counter Mortar Radar (LCMR)	2.850	3.187	2.136	-	2.136	4.239	4.970	5.442	3.500	Continuing	Continuing
• PE 0604823A, Proj L88: PE 0604823A, Proj L88, Enhanced AN/TPQ-36	-	6.048	7.469	-	7.469	6.784	8.515	9.196	9.422	Continuing	Continuing
• SSN B05201: SSN B05201, Lightweight Counter Mortar Radar (LCMR)	63.472	130.730	20.459	-	20.459	9.618	-	-	8.427	Continuing	Continuing
• SSN B05310: SSN B05310, Enhanced AN/TPQ-36	198.379	314.509	329.057	-	329.057	148.700	28.400	7.110	7.443	Continuing	Continuing
• PE 0604741A, Proj FG5: PE 0604741A, Proj FG5, Counter Unmanned Aerial Systems (C-UAS)	-	143.900	-	-	-	-	-	-	-	Continuing	Continuing
• SSN H30505: SSN H30505, Counter Unmanned Aerial Systems (C-UAS) Efforts	-	174.640	10.000	57.500	67.500	-	-	-	-	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / <i>Air Defense Command, Control and Intelligence - Eng Dev</i>	Project (Number/Name) 149 / <i>Counter-Rockets, Artillery & Mortar</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

This program is an integral part of the Army Integrated Air and Missile Defense (IAMD) architecture.

D. Acquisition Strategy

The C-RAM program is following an evolutionary acquisition strategy for rapid fielding of mature technology to the user. The objective of the strategy is to balance needs, available technology, and resources to quickly provide a robust capability to engage RAM threats. Both C-RAM Intercept (LPWS) and RAM Warn have transitioned to acquisition programs and continue to capitalize on RDTE investments (e.g., reuse/repurpose of Navy interceptor, Future Combat Systems (FCS) sensor technology development for Ku band Radio Frequency System (KuRFS) radar, etc.). Development and upgrade of C-RAM C2 software, to include enhanced capability to support emerging Mission Command requirements, technology insertion, and interoperability, is accomplished through a five-year CPIF contract awarded in April 2015 to Northrop Grumman Mission Systems.

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 / 5					R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev				Project (Number/Name) FG5 / Counter Unmanned Aerial Systems (CUAS)			
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
FG5: Counter Unmanned Aerial Systems (CUAS)	-	0.000	143.900	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	143.900
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project FG5 has been created for transparency and in support of the Counter Unmanned Aerial System (C-UAS) Joint Operational Needs (JUONS) CC-0558.

FY17 Overseas Contingency Operations (OCO) December 2016 Amendment in the amount of \$78.700 million supports Joint Urgent Operational Need (JUON) CC-0558 addressing incremental improvements to deployed capability as informed by test events at each phase.

FY17 Overseas Contingency Operations (OCO) March 2017 Amendment in the amount of \$65.200 million supports Joint Urgent Operational Need (JUON) CC-0558 to develop and test kinetic kill defeat options for integration into the Low-slow-small UAS Integrated Defeat System.

A. Mission Description and Budget Item Justification

For transparency and in support of the Counter Unmanned Aerial System (C-UAS) Joint Operational Needs (JUONS) CC-0558, Project FG5 was created to support the identification, development, testing, evaluation and integration of technologies to provide an overall evolutionary capability to defeat small Unmanned Aerial Systems (UAS) threats. The C-UAS effort will provide the capability for the warfighter to comprehensively detect, identify and defeat enemy Group 1 and 2 light weight, low altitude UAS. The C-UAS effort involves a phased development and testing approach of Counter UAS Systems. The incremental approach provides interim standalone capability within the first few months and achieves a full networked capability by end of two-year JUON period.

Rapid Acquisition Authority (RAA) approved for the first quarter FY 2017 research and development efforts in the amount of \$65.500 million was sourced by FY 2017 OCO Operations and Maintenance (OMA) funds. These funds are being used in support of system engineering, testing, integration, and logistics.

Rapid Acquisition Authority (RAA) approved for research and development efforts in the amount of \$76.000 million starting in late first quarter FY2017 was sourced by FY 2017 OCO Operations and Maintenance (OMA) funds. These funds are being used for development and integration of mobile and expeditionary Low-slow-small UAS Integrated Defeat Systems.

FY17 Overseas Contingency Operations (OCO) December 2016 Amendment in the amount of \$78.700 million supports Joint Urgent Operational Need (JUON) CC-0558 addressing incremental improvements to deployed capability as informed by test events at each phase.

FY17 Overseas Contingency Operations (OCO) March 2017 Amendment in the amount of \$65.200 million supports Joint Urgent Operational Need (JUON) CC-0558 to develop and test kinetic kill defeat options for integration into the Low-slow-small UAS Integrated Defeat System.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev	Project (Number/Name) FG5 / Counter Unmanned Aerial Systems (CUAS)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Title: Counter Unmanned Aerial System Engineering and Dismounted Options</p> <p>Description: Perform system engineering, testing, integration, and overall support of the C-UAS JUON. Supports test events to inform modifications to deployed and planned systems as well as inform procurement decisions for dismounted systems.</p> <p>FY 2017 Plans: Develop radar modifications to support improved C-UAS capability; conduct test events to assess performance of emerging and available C-UAS systems; conduct system engineering to integrate components and systems into the Low-slow-small UAS Integrated Defeat System (LIDS) architecture; conduct post-test analysis to inform ongoing development efforts; and test and assess dismounted CUAS systems for inclusion into the CUAS family of systems.</p>	-	78.700	-	-	-
<p>Title: Counter Unmanned Aerial System Kinetic Kill Defeat Options</p> <p>Description: Development, Integration, and Test of kinetic kill defeat options for integration into the Low-small-small UAS Integrated Defeat System.</p> <p>FY 2017 Plans: Develop, integrate, and test kinetic, or hard kill, defeat solutions into the Low-slow-small Unmanned Aerial System (UAS) Integrated Defeat System (LIDS): 1) integrate the Compact Laser Weapon System with Counter-Rocket, Artillery, Mortar (C-RAM) command and control, increases power from 2kW to 5kW of the laser subsystem, and support Phase 1a testing; 2) integrate the Coyote warhead, proximity fuze, and midcourse guidance for Block 1 and Block 2, and support Phase 1a and Phase 2 testing; and 3) develop the Vehicle Mounted Gun System fire control solution capability for UAS targets, and support Engineering, Fire Control, and Phase 2 testing.</p>	-	65.200	-	-	-
Accomplishments/Planned Programs Subtotals	-	143.900	-	-	-

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
• Rapid Acquisition Authority (RAA) 1: Rapid Acquisition	-	65.500	-	-	-	-	-	-	-	0	65.500

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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 / 5	R-1 Program Element (Number/Name) PE 0604741A / Air Defense Command, Control and Intelligence - Eng Dev	Project (Number/Name) FG5 / Counter Unmanned Aerial Systems (CUAS)
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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>
<i>Authority (RAA) 1 for Baseline Plan. Source: FY 2017 OCO OMA</i>											
• Rapid Acquisition Authority (RAA) 2: Rapid Acquisition Authority (RAA) 2 for Acceleration Plan. Source: FY 2017 OCO OMA	-	76.000	-	-	-	-	-	-	-	0	76.000
• SSN H30505: SSN H30505, C-UAS OPA OCO	-	174.640	10.000	57.500	67.500	-	-	-	-	0	242.140

Remarks

All funding supports Counter Unmanned Aerial System (C-UAS) Joint Operational Needs (JUONS) CC-0558.

D. Acquisition Strategy

The C-UAS program is executing an acquisition strategy for rapid fielding of emerging technology and initial fielding to selected sites in Phase 1. In Phase 1a testing of mature solutions and down selecting will be made for participation in Phase 2 which will test fully networked, fixed/mobile capability, sustainable solution and deploy full capability to all locations. C-UAS is rapidly developing, integrating and deploying the solution through a contract awarded January 2017 to Syracuse Research Corporation.

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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604742A / <i>Constructive Simulation Systems 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	-	22.609	17.887	18.562	-	18.562	16.792	13.572	9.628	7.903	Continuing	Continuing
361: <i>Intelligence Simulation Systems</i>	-	5.303	5.851	6.334	-	6.334	5.806	3.390	1.447	0.340	Continuing	Continuing
362: <i>Jnt Land Component Constructive Trng</i>	-	17.306	12.036	12.228	-	12.228	10.986	10.182	8.181	7.563	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element funds the development of constructive and wargame simulations used to realistically train commanders and their battle staffs on today's complex battlefield conditions.

Project 361 funds the development of the Intelligence Electronic Warfare Tactical Proficiency Trainer (IEWTPT) that provides Warfighting Commanders at all echelons the ability to train with Intelligence, Surveillance, and Reconnaissance (ISR) products based on realistic ISR assets, people (including the maneuver commander, G-2, G-3, collection manager, analyst/operator) and processes. IEWTPT provides a realistic Intelligence target environment for Multi-Intelligence disciplines. Signals Intelligence (SIGINT), Imagery Intelligence (IMINT), Human Intelligence (HUMINT), Counterintelligence (CI) and Geospatial Intelligence (GEOINT) must stimulate multiple systems such as: Prophet, Distributed Common Ground Station-Army (DCGS-A), Joint Surveillance Target Attack Radar System-Common Ground Station (JSTARS-CGS), Tactical Unmanned Aerial Vehicle (TUAV), Tactical Exploitation System/Distributed Tactical Exploitation System (TES/DTES). IEWTPT is the only Army Simulation System supporting ISR training from the Warfighter to the Military ISR Analyst/System Operator.

Project 362, Joint Land Component Constructive Training Capability (JLCCTC) supports Army Title X training worldwide for Army Commanders and their staff at Mission Training Complexes (MTCs), Training and Doctrine Command (TRADOC) facilities, and other customer locations. JLCCTC trains Commanders and their staff in Decisive Actions to include offensive, defensive, stability, and civil support operations. JLCCTC is a software modeling and simulation capability that contributes to Army Training Mission Area by providing appropriate levels of model and simulation resolution and fidelity to support unit collective and combined arms training. The JLCCTC provides a composable federation configurable to any combination of models and simulations, as required by training exercise intent/design. The JLCCTC provides accurate representations of tactically and operationally relevant land warfare operations executed in a contemporary Joint operating environment/context in support of Army Training and Readiness.

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604742A / <i>Constructive Simulation Systems 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	23.364	17.887	18.505	-	18.505
Current President's Budget	22.609	17.887	18.562	-	18.562
Total Adjustments	-0.755	0.000	0.057	-	0.057
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.755	-			
• Adjustments to Budget Years	0.000	0.000	0.057	-	0.057

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604742A / <i>Constructive Simulation Systems Development</i>				Project (Number/Name) 361 / <i>Intelligence Simulation 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
361: <i>Intelligence Simulation Systems</i>	-	5.303	5.851	6.334	-	6.334	5.806	3.390	1.447	0.340	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program element funds the development of constructive and wargame simulations used to realistically train commanders and their battle staffs on today's complex battlefield conditions. Project 361 funds the development of the Intelligence Electronic Warfare Tactical Proficiency Trainer (IEWTPT). IEWTPT is a Non-System Training Device (NTSD) which supports training intelligence soldiers by simulating and stimulating Military Intelligence (MI) organic or surrogate equipment. It enables sustainment of critical individual and collective tasks/skills and is the core of the United States Army Intelligence Center of Excellence (USAICoE) Military Intelligence (MI) holistic training strategy and includes both stand-alone and network enabled training capabilities. IEWTPT provides a realistic Intelligence target environment for Multi-Intelligence disciplines such as Signals Intelligence (SIGINT), Imagery Intelligence (IMINT), Human Intelligence (HUMINT), Counterintelligence (CI), Geospatial Intelligence (GEOINT) and must stimulate and emulate multiple Intelligence, Surveillance, Reconnaissance (ISR) platform systems such as: PROPHET, Distributed Common Ground Station-Army (DCGS-A), Joint Surveillance Target Attack Radar System-Common Ground Station (JSTARS-CGS), Tactical Unmanned Aerial Vehicle (TUAV), Tactical Exploitation System/Distributed Tactical Exploitation System (TES/DTES), and Aerial Intelligence assets such as Enhanced Medium Altitude Reconnaissance and Surveillance System (EMARSS), Airborne Reconnaissance Low-Enhanced (ARL-E), and Guardrail Common Sensor (GRCS). IEWTPT provides static and dynamic training capabilities (interactive environment for individual, collective, and Live, Virtual, and Constructive integrated mission rehearsals/exercises utilizing a constructive simulation feed) in an integrated, playback, and stand-alone mode. IEWTPT is composed of three major components: Technical Control Cell (TCC), Target Signature Arrays (TSA) or Simulation Interface, and the HUMINT Control Cell (HCC). The IEWTPT TCC provides critical Intel enhancements to a constructive simulation to stimulate go-to-war or surrogate ISR systems where system operators/analysts are able to exploit exercise intelligence data during training, just as they would in a "real world" operation.

FY 2018 funding in the amount of \$6.334 million supports U.S. Army readiness by developing interface capabilities with Intelligence, Surveillance, Reconnaissance (ISR) platform programs/systems of record to train detailed military intelligence mission essential tasks in a simulation environment. FY 2018 funds provide the development of web-enabled capabilities and common operating environment/computing environment (COE/CE) migration for Command Post, Sensor, and Data Center for both the Human Control Cell (HCC) and Technical Control Cell (TCC).

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

	FY 2016	FY 2017	FY 2018
Title: IEWTPT development, integration and support.	4.474	5.022	5.505
Description: Continue IEWTPT development, integration and support to the user community.			
FY 2016 Accomplishments:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604742A / <i>Constructive Simulation Systems Development</i>	Project (Number/Name) 361 / <i>Intelligence Simulation Systems</i>

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

	FY 2016	FY 2017	FY 2018
<p>Supported V6.0 release for the development of detailed simulation interface capabilities for Intelligence, Surveillance, Reconnaissance (ISR) platform programs/systems in the PEO Intelligence Electronic Warfare & Sensors portfolio to support home-station intelligence training. The main effort developed capabilities in IEWTPT that support the training requirements for the DCGS-A program Processing, Exploitation and Dissemination (PED) mission. Developed HUMINT-Counter-intelligence and Human Intelligence Automated Reporting and Collection Systems (CHARCS) and Machine Foreign Language Translation, gesture recognition, retinal projection, and machine learning for integration into simulation /user environment. Additional FY 16 accomplishments included three key sensor simulation interface builds for aerial layer communications intelligence (COMINT) collection and geospatial intelligence (GEOINT) training. IEWTPT simulation provided the synthetic environment and models replicating behavior of the live receiver where operators respond and train exactly as they would in a live environment. Two Technical Control Cell (TCC) deliveries were completed in FY 16 to Ft Stewart, GA and Joint Base San Antonio, TX and the 470th Military Intelligence Brigade and Camp Bullis training requirements. Prophet 12B receiver SIGINT collection capabilities are complete with certification testing in 1st Quarter 2017 at Goodfellow Air Force Base, TX. Human Control Cell (HCC) initial web-based delivery capabilities are complete and testing is on-going for Army Training Network hosting.</p> <p>FY 2017 Plans: Will support V7.0 release for the development of detailed simulation interface capabilities for Intelligence, Surveillance, Reconnaissance (ISR) platform programs/systems in the PEO Intelligence Electronic Warfare & Sensors portfolio to support homestation intelligence training. The main effort will be to expand all source intelligence development in IEWTPT that support the training requirements for the DCGS-A program and their Processing, Exploitation and Dissemination (PED) mission. Expand HUMINT web-based implementation and Counter-intelligence and Human Intelligence Automated Reporting and Collection Systems (CHARCS) and Machine Foreign Language Translation, biometrics related intelligence for integration into the simulation /user environment. Initiate new PM Prophet 12C receiver SIGINT collection training capabilities for testing, certification and integration into software baseline. Develop and integrate new Aerial ISR communications intelligence sensor emulation capabilities into program baseline for the Enhanced Medium Altitude Reconnaissance Surveillance System (EMARSS). Will complete web-based delivery capability for the Human Control Cell (HCC) and begin prototype development for cloud capabilities to support Technical Control Cell (TCC) distributed training requirements. Will execute technology development and integration supporting product deliverables needed to meet Ft. Huachuca and Army G2 training strategy requirements. Develop linkages to migrate to designated Core Data Center/Common Operating Environment/Computing Environments.</p> <p>FY 2018 Plans: Will support V8.0 release for the development of detailed simulation interface capabilities for Intelligence, Surveillance, Reconnaissance (ISR) platform programs/systems in the PEO Intelligence Electronic Warfare & Sensors portfolio to support home-station intelligence training. The main effort will be to expand all source intelligence development in IEWTPT that support the training requirements for the all source analysis mission. Expand HUMINT, point of need, web-based training capabilities. Refine SIGINT capabilities and evolve sensor emulation effects modeling as well as electronic intelligence replication for the</p>			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604742A / <i>Constructive Simulation Systems Development</i>	Project (Number/Name) 361 / <i>Intelligence Simulation Systems</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
simulation /user environment. Develop and integrate new Aerial ISR communications intelligence sensor emulation capabilities such as dismounted moving target indicator (DMTI) and improved synthetic aperture radar into program baseline representing Enhanced Medium Altitude Reconnaissance Surveillance System (EMARSS) and Guardrail Common Sensor (GRCS) capabilities. Will execute technology development and integration supporting product deliverables needed to meet Ft. Huachuca and Army G2 training strategy requirements. Develop linkages to migrate to designated Core Data Center/Common Operating Environment/ Computing Environments.			
Title: Program Management for the Intelligence Electronic Warfare Tactical Proficiency Trainer (IEWTPT). Description: Government Program Management for the IEWTPT program. FY 2016 Accomplishments: Provided continuation of program oversight, lifecycle management planning, and Combat Developer support. Enabled the configuration control and oversight of interfaces with complementary programs. Allowed continuous participation in planning, integration, and testing of IEWTPT components in a federation (family of systems) environment. Covered technology insertion studies and reviews of deliverables needed to be ready for contract award for the program. FY 2017 Plans: Will provide for the continuation of program oversight, lifecycle management planning, and Combat Developer support. Will enable the configuration control and oversight of interfaces with complementary programs. Will allow continuous participation in planning, integration, and testing of IEWTPT components in a federation (family of systems) environment. Will cover technology insertion studies and reviews of deliverables needed to be ready for contract award for the program. FY 2018 Plans: Will provide for the continuation of program oversight, lifecycle management planning, and Combat Developer support. Will enable the configuration control and oversight of interfaces with complementary programs. Will allow continuous participation in planning, integration, and testing of IEWTPT components in a federation (family of systems) environment. Will cover technology insertion studies and reviews of deliverables needed to be ready for contract award for the program.	0.829	0.829	0.829
Accomplishments/Planned Programs Subtotals	5.303	5.851	6.334

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>
• Appropriation NA0102: <i>Appropriation NA0102; Training Devices, Nonsystem, Intelligence</i>	3.797	5.377	6.693	-	6.693	5.491	5.585	2.611	-	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604742A / <i>Constructive Simulation Systems Development</i>	Project (Number/Name) 361 / <i>Intelligence Simulation Systems</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>
• TBWG, OMA 121: <i>TBWG, OMA 121</i>	2.097	4.270	3.461	-	3.461	2.704	2.767	2.758	0.368	Continuing	Continuing

Remarks

D. Acquisition Strategy

The FY18 funds will resource the first option to the new IEWTPT IDIQ contract awarded 16 Feb 2017 to General Dynamics. The FY 18 funds will provide continued version 8.0 development, testing, cyber security, production, integration, fielding, training, hardware/software updates, and exercise support of the IEWTPT system. Software version releases are planned, as well as engineering for product improvement maintenance releases.

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 / 5					R-1 Program Element (Number/Name) PE 0604742A / <i>Constructive Simulation Systems Development</i>				Project (Number/Name) 362 / <i>Jnt Land Component Constructive Trng</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
362: <i>Jnt Land Component Constructive Trng</i>	-	17.306	12.036	12.228	-	12.228	10.986	10.182	8.181	7.563	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Land Component Constructive Training Capability (JLCCTC) supports Army Title X training worldwide for Army Commanders and their staff at Mission Training Complexes (MTCs), Training and Doctrine Command (TRADOC) facilities, and other customer locations. JLCCTC trains Commanders and their staff in Decisive Actions to include offensive, defensive, stability, and civil support operations. JLCCTC is a software modeling and simulation capability that contributes to Army Training Mission Area by providing appropriate levels of modeling and simulation resolution and fidelity to support unit collective and combined arms training. JLCCTC provides a composable federation configurable to any combination of models and simulations, as required by training exercise intent/design. JLCCTC provides accurate representations of tactically and operationally relevant land warfare operations executed in a contemporary Joint operating environment/context and in support of Army Training and Readiness.

FY 2018 funding in the amount of \$12.228 million supports development, integration and test, and verification and validation activities of JLCCTC Version 8.1 and beginning Version 9.0 of the Constructive Simulation Strategy implementation activities to train Commanders and their Staff. This Constructive Simulation Strategy will merge software from two Federations (Multi-Resolution Federation used for Brigade/Division and above exercises and Entity Resolution Federation used for Brigade and below exercises) into a single Federation solution. JLCCTC will continue to support emerging Common Operating Environment / Computing Environment (COE/CE), Mission Command (MC), Information Assurance (IA), and Concurrency warfighter requirements. In addition, JLCCTC will continue to support the integration activities with Live, Virtual, Constructive-Integrated Architecture (LVC-IA) and Combat Training Center Instrumentation System (CTC-IS) to accomplish a Single Federation solution.

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

	FY 2016	FY 2017	FY 2018
Title: Improve JLCCTC software models to comply with emerging Common Operating Environment (COE)/Computing Environment (CE) requirements.	1.890	0.900	1.300
Description: Improve JLCCTC software models to comply with emerging COE/CE requirements.			
FY 2016 Accomplishments: Continued improvements of JLCCTC software models to maintain concurrency with Command Post (CP) system interfaces and initial analysis to assess impacts of emerging Cloud standards in support of COE compliance.			
FY 2017 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604742A / <i>Constructive Simulation Systems Development</i>	Project (Number/Name) 362 / <i>Jnt Land Component Constructive Trng</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Will continue improvements of JLCCTC software development of architectural/system modifications to maintain concurrency/compliance with Command Post system interfaces in support of COE compliance.</p> <p>FY 2018 Plans: Will continue improvements of JLCCTC software models to include common overlay development/modifications in support of COE compliance/standards.</p>				
<p>Title: Improve JLCCTC software models to meet emerging Mission Command (MC) stimulation and Information Assurance (IA) requirements.</p> <p>Description: Improve JLCCTC software models to meet emerging Mission Command (MC) stimulation and Information Assurance (IA) requirements.</p> <p>FY 2016 Accomplishments: Continued improvements of JLCCTC software models to support MC and IA requirements.</p> <p>FY 2017 Plans: Improve JLCCTC software models to support emerging Mission Command requirements and start compliance with the Information Assurance Risk Management Framework (RMF).</p> <p>FY 2018 Plans: Continue to evolve JLCCTC to support emerging Mission Command requirements and fully comply with the Information Assurance Risk Management Framework (RMF) requirement.</p>		3.451	1.559	1.512
<p>Title: Improve JLCCTC software models to meet emerging warfighter requirements for Concurrency of Commander and staff training (Battalion thru Theater Level).</p> <p>Description: Improve JLCCTC software models to meet emerging warfighter requirements for Concurrency of Commander and staff training (Battalion thru Theater Level).</p> <p>FY 2016 Accomplishments: Continued enhancing/improving JLCCTC software models to support Commander and staff training.</p> <p>FY 2017 Plans: Evolve JLCCTC software models to support emerging requirements in support of Commander and staff training exercises.</p> <p>FY 2018 Plans:</p>		2.140	2.130	1.892

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604742A / <i>Constructive Simulation Systems Development</i>	Project (Number/Name) 362 / <i>Jnt Land Component Constructive Trng</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
Continue to evolve JLCCTC software models to support additional emerging requirements in support of Commander and staff warfighter training exercises through Theater level.				
Title: Technical Engineering Services/Support for JLCCTC Program Description: Technical Engineering Services/Support for JLCCTC Program FY 2016 Accomplishments: Continued Engineering and Support for the JLCCTC Program.		1.200	-	-
Title: Engineering and Manufacturing Development (EMD) phase contract activity for Constructive Strategy Implementation Description: Constructive Strategy Implementation FY 2016 Accomplishments: Begin Phase I execution of the Constructive Simulation Strategy (Single Federation Solution), version 8.0. FY 2017 Plans: Begin Phase II (Live, Virtual, Constructive-Integrated Architecture [LVC-IA]) integration in support of the Constructive Simulation Strategy (version 8.1). FY 2018 Plans: Complete the Live, Virtual, Constructive-Integrated Architecture (LVC-IA) integration and incorporate the Combat Training Center Instrumentation System (CTC-IS) capability in support of the Constructive Simulation Strategy (version 8.1 and beginning of version 9.0).		3.376	2.165	2.164
Title: Government System Test and Evaluation for the Joint Land Component Constructive Training Capability (JLCCTC) Program. Description: Government System Test and Evaluation for the Joint Land Component Constructive Training Capability (JLCCTC). FY 2016 Accomplishments: Developed and evaluated system performance and conducted system test events (Integration and Testing) in support of the JLCCTC v8.0 validation event. FY 2017 Plans: Developed and evaluated system performance and conducted system test events (Integration and Testing) in support of the JLCCTC v8.1 validation event. FY 2018 Plans:		1.150	1.317	1.372

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604742A / <i>Constructive Simulation Systems Development</i>	Project (Number/Name) 362 / <i>Jnt Land Component Constructive Trng</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Begin development and integration by conducting system test events (Integration and Testing) in support of a future JLCCTC v9.0 validation event.			
<p>Title: Government Program Management for the Joint Land Component Constructive Training Capability (JLCCTC) Program.</p> <p>Description: Supports Government program management, engineering, logistics, contracting support and continues operational evaluation support for JLCCTC.</p> <p>FY 2016 Accomplishments: Supported Government program management, engineering, logistics, contracting support and continued operational evaluation support for JLCCTC.</p> <p>FY 2017 Plans: Supports Government program management, engineering, logistics, contracting support and continues operational evaluation support for JLCCTC.</p> <p>FY 2018 Plans: Supports Government program management, engineering, logistics, contracting support and continues operational evaluation support for JLCCTC.</p>	4.099	3.965	3.988
Accomplishments/Planned Programs Subtotals	17.306	12.036	12.228

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>
• NSTD Command & Control: OPA, NA0103	40.172	41.959	35.578	-	35.578	43.141	35.452	35.605	36.701	Continuing	Continuing
• TBWG: OMA, 121	10.400	10.668	10.830	-	10.830	11.063	11.220	11.354	11.552	Continuing	Continuing

Remarks

D. Acquisition Strategy
JLCCTC Indefinite Delivery/Indefinite Quantity (ID/IQ) contract was awarded to Lockheed Martin on 27 March 2013. This contract has a period of performance/ordering period of five years with a total ceiling amount not to exceed \$146M. The plan is to award a two-year Delivery Order through 2nd Quarter FY 20. Re-compete activities will begin during FY 18 with a planned award of a new contract by 2nd Quarter FY 20.

Activities under this contract include System Engineering, Software Development, Integration & Test, support to validation events and PDSS/P3I support.

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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 / 5	PE 0604742A / <i>Constructive Simulation Systems Development</i>	362 / <i>Jnt Land Component Constructive Trng</i>

JLCCTC produces a major software release/version every 12 to 24 months, which is then distributed/fielded to over 40 MTCs worldwide in support of Army Command and Staff Training.

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 / 5				PE 0604742A / Constructive Simulation Systems Development				362 / Jnt Land Component Constructive Trng							
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	Various	PEO STRI : Orlando, FL	55.063	4.099	Oct 2015	3.965	Oct 2016	3.988	Oct 2017	-		3.988	Continuing	Continuing	Continuing
Subtotal			55.063	4.099		3.965		3.988		-		3.988	-	-	-
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
Constructive Strategy Implementation	C/CPFF	Lockheed Martin : Orlando, FL	0.000	3.376	Mar 2016	2.165	Jan 2017	2.164	Oct 2017	-		2.164	Continuing	Continuing	Continuing
Integration of JLCCTC	SS/FFP	Various : Various	56.851	-		-		-		-		-	Continuing	Continuing	Continuing
Improve JLCCTC to meet emerging warfighter requirements.	C/CPFF	Lockheed Martin : Orlando, FL	0.000	2.140	Jan 2016	2.130	Jan 2017	1.892	Mar 2018	-		1.892	Continuing	Continuing	Continuing
MC Systems Stimulation and Information Assurance	C/CPFF	Lockheed Martin : Orlando, FL	0.000	3.451	Mar 2016	1.559	Dec 2016	1.512	Dec 2017	-		1.512	Continuing	Continuing	Continuing
COE Compliance	C/CPFF	Lockheed Martin : Orlando, FL	0.000	1.890	Mar 2016	0.900	Dec 2016	1.300	Dec 2017	-		1.300	Continuing	Continuing	Continuing
MRF-W Development of Army Training System	C/CPFF	Various : Various	10.200	-		-		-		-		-	Continuing	Continuing	Continuing
Development of logistics model	Various	Tapestry : San Diego, CA	20.615	-		-		-		-		-	0.000	20.615	20.615
WARSIM Development of Army Training System	SS/CPFF	Lockheed Martin Info Systems : Orlando, FL	122.061	-		-		-		-		-	0.000	122.061	122.570
Subtotal			209.727	10.857		6.754		6.868		-		6.868	-	-	-

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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 / 5				PE 0604742A / Constructive Simulation Systems Development				362 / Jnt Land Component Constructive Trng							
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 & Tech Spt (SE, CM, Lab, Documentation)	Various	Various : Various	10.112	1.200	Jan 2016	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			10.112	1.200		-		-		-		-	-	-	-
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
System T&E (I&T, VE, ORE)	Various	Various : Various	19.648	1.150	May 2016	1.317	Nov 2016	1.372	Nov 2017	-		1.372	Continuing	Continuing	Continuing
Verification, Validation and Accreditation	Various	Various : Various	13.244	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			32.892	1.150		1.317		1.372		-		1.372	-	-	-
Project Cost Totals			307.794	17.306		12.036		12.228		-		12.228	-	-	-
Remarks															

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604742A / <i>Constructive Simulation Systems Development</i>	Project (Number/Name) 362 / <i>Jnt Land Component Constructive Trng</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				
JLCCTC V5.6 / V7.1 / V8.0 System Engr / Develop / I&T / Validation	JLCCTC V5.6 / V7.1 / V8.0				JLCCTC Version 5.6 / Version 8.0 Release				Version 8.1				JLCCTC V8.1 Release				Version 9.0				JLCCTC V9.0 Release				Version 10.0				JLCCTC V10.0 Release			
(1) JLCCTC Version 5.6 / Version 8.0 Release																																
JLCCTC Version 8.1 System Engr / Develop / I&T / Validation																																
(2) JLCCTC V8.1 Release																																
JLCCTC Version 9.0 System Engr / Develop / I&T / Validation																																
(3) JLCCTC Version 9.0 Release																																
JLCCTC Version 10.0 System Engr / Develop / I&T / Validation																																
(4) JLCCTC Version 10.0 Release																																
JLCCTC Integration into LVC-IA																																
JLCCTC Constructive Strategy Implementation (Single Federation)																																
JLCCTC Version 11.0 Sys Engr/ Develop/ I&T/ Validation																																

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604742A / <i>Constructive Simulation Systems Development</i>	Project (Number/Name) 362 / <i>Jnt Land Component Constructive Trng</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
JLCCTC V5.6 / V7.1 / V8.0 System Engr / Develop / I&T / Validation	4	2014	4	2016
JLCCTC Version 5.6 / Version 8.0 Release	4	2016	4	2016
JLCCTC Version 8.1 System Engr / Develop / I&T / Validation	4	2016	4	2017
JLCCTC V8.1 Release	4	2017	4	2017
JLCCTC Version 9.0 System Engr / Develop / I&T / Validation	1	2018	4	2019
JLCCTC Version 9.0 Release	4	2019	4	2019
JLCCTC Version10.0 System Engr / Develop / I&T / Validation	1	2020	4	2021
JLCCTC Version 10.0 Release	4	2021	4	2021
JLCCTC Integration into LVC-IA	1	2014	4	2022
JLCCTC Constructive Strategy Implementation (Single Federation)	2	2016	4	2019
JLCCTC Version 11.0 Sys Engr/ Develop/ I&T/ Validation	1	2022	4	2023

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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 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604746A / Automatic Test Equipment Development
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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	-	8.636	8.813	8.344	-	8.344	14.464	12.085	11.060	11.245	Continuing	Continuing
L59: Diagnost/Expert Sys	-	4.544	6.034	5.883	-	5.883	8.514	7.312	6.903	6.961	Continuing	Continuing
L65: Test Equipment Development	-	4.092	2.779	2.461	-	2.461	5.950	4.773	4.157	4.284	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element (PE) provides for development and testing of general-purpose test equipment, state-of-the-art diagnostics and prognostics technologies, and software and systems to support the increasingly complex electronic components of the Army's new and upgraded weapon systems. It focuses on implementation of commercial test and diagnostic technologies across multiple weapon platforms to minimize the cost of troubleshooting and maintenance of Army equipment in the field.

Modular, reconfigurable automatic and semi-automatic systems are being developed under this program to satisfy weapon system test and diagnostics requirements. The Next Generation Automatic Test System (NGATS) provides state-of-the-art test and diagnostic capabilities to support current and future weapon systems. It is the platform for transitioning Agile Rapid Global Combat Support System (ARGCS) technologies into the Army weapon system support structure, and it will replace several aging automatic test systems (ATS) that are becoming prohibitively expensive to operate and maintain.

This PE also provides for continued development and improvement of general-purpose test equipment and calibration standards with emphasis on the incorporation of digital electronics and tailoring of configurations to improve deployability, mobility and survivability of the support equipment. It includes development, demonstration and testing of calibration standards and techniques to support new Army test equipment requirements. It provides for feasibility studies, market research, inventory analyses, bid sample testing and prototyping to support acquisition of calibration systems and general-purpose test and diagnostics equipment.

FY 2018 Base funding for this program continues incremental development of the Army's standard NGATS which will improve deployability and mobility of test and diagnostic equipment. The NGATS provides state-of-the-art test and diagnostic capabilities and a means for reducing the Army's test equipment operating and support costs and the costs for supporting a number of the Army's vital warfighting systems. The FY 2018 funding will develop or significantly modify test equipment to satisfy modular force and homeland security support requirements that cannot be accommodated with test equipment currently available in the commercial marketplace such as radio frequency (RF) and electro-optic (EO) testing capability. It will also provide for technology enhancements to the Army's standard at-system tester to meet test and diagnostic requirements of the supported weapon systems, develop/redesign test program sets and hardware for support of legacy and emerging weapon systems, develop a network centric software framework for NGATS, and develop and test general-purpose test equipment and calibration standards to meet Army weapon system support requirements.

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604746A / <i>Automatic Test Equipment 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	8.960	8.813	10.362	-	10.362
Current President's Budget	8.636	8.813	8.344	-	8.344
Total Adjustments	-0.324	0.000	-2.018	-	-2.018
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.324	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	0.000	0.000	-2.018	-	-2.018

Change Summary Explanation

FY2016 - \$0.324 million reprogrammed to meet higher priority requirements

FY2018 - \$2.018 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 / 5					R-1 Program Element (Number/Name) PE 0604746A / Automatic Test Equipment Development				Project (Number/Name) L59 / Diagnost/Expert Sys			
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
L59: Diagnost/Expert Sys	-	4.544	6.034	5.883	-	5.883	8.514	7.312	6.903	6.961	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds development of and system enhancements for the Next Generation Automatic Test System (NGATS) and the Maintenance Support Device (MSD). The NGATS is a general-purpose automatic test system (ATS) that provides test and diagnostic capabilities required to support current and future weapons and combat support systems and will facilitate retirement of aging and obsolete test equipment that is imposing increasing logistics and operations and support cost burdens. It is the platform for transitioning Agile Rapid Global Combat Support System (ARGCS) Advanced Concept Technology Demonstration (ACTD) technologies into the Army weapon system support structure. The ARGCS ACTD initiative was sponsored by the Department of Defense, and all Services are expected to transition demonstrated technologies into their ATS programs. The MSD is the Army's standard at-system tester and requires continuing upgrades to support technology advancements in the supported weapon systems. This project funds development projects to incorporate the most current relevant technology into the next generation MSD, supports capability enhancement of a wireless at-platform test set (WATS) connectivity, develops capabilities to minimize or eliminate Army dependency on expensive proprietary software to support tactical vehicles, and maintains compatibility with emerging platform hardware bus technology and software interface requirements. This project also provides for continuing efforts in the development and testing of common procedures utilizing existing test program sets and software applications, and market surveys of commercially available test equipment, methods and procedures to determine applicability to Army requirements. The test and diagnostic systems and procedures developed under this project are essential for ensuring the operational readiness, accuracy and effectiveness of the Army's warfighting systems.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: NGATS Radio Frequency (RF) Test Capability	0.500	1.000	1.000	-	1.000
Description: Develop and integrate NGATS RF test capability					
FY 2016 Accomplishments: Initiated RF Interface Unit development, prototyping and integration of the entire RF test asset into the NGATS.					
FY 2017 Plans: Continue prototyping and integration of RF subsystem into the NGATS.					
FY 2018 Base Plans: Continue prototyping and integration of RF subsystem into the NGATS, specifically the RF Interface Unit and the full-rate production NGATS configuration. Develop RF software libraries to support programs such as Counter					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / <i>Automatic Test Equipment Development</i>	Project (Number/Name) L59 / <i>Diagnost/Expert Sys</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Radio-Controlled Improvised Explosive Device (RCIED) Electronic Warfare (CREW)/Duke, TPQ-53 Radar and other emerging weapons systems.					
<p>Title: NGATS Increment 2</p> <p>Description: Develop and test hardware and software for NGATS Increment 2 support capability</p> <p>FY 2016 Accomplishments: Continued development and testing of hardware and software for support of Increment 2 systems (Avenger, Multiple Launch Rocket System, TOW Missile System, Paladin and Common Remotely Operated Weapons Station II (CROWS II)).</p> <p>FY 2017 Plans: Continue development and testing of hardware and software for support of additional Increment 2 systems (Counter RCIED (Radio-Controlled Improvised Explosive Device) Electronic Warfare (CREW) Duke, Precision Fires, Armored Multi-Purpose Vehicle (AMPV), Stryker Mobile Gun System (MGS), and Joint Assault Bridge (JAB)).</p> <p>FY 2018 Base Plans: Continue development and testing of hardware and software for support of emerging required capabilities such as high-speed digital, fiber channel, high-speed Ethernet and serial busses, and high power test (600V). Develop new software libraries to utilize instrument functions.</p>	0.730	0.500	0.382	-	0.382
<p>Title: NGATS Electro-Optics (EO) Subsystem</p> <p>Description: Develop and test hardware and software for NGATS electro-optics (EO) subsystem (to include the capability to support new ground and aerial sensors for unmanned air and ground vehicles)</p> <p>FY 2016 Accomplishments: Initiated hardware and software integration/testing of the EO subsystem into the NGATS for use by test program set (TPS) developers and depots.</p> <p>FY 2017 Plans: Continue integration/testing of EO subsystem into NGATS to include redesign for production and optimal logistic support.</p> <p>FY 2018 Base Plans:</p>	0.200	0.500	0.200	-	0.200

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / Automatic Test Equipment Development	Project (Number/Name) L59 / Diagnost/Expert Sys

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Complete integration/testing of EO subsystem.					
<p>Title: Developmental and Operational Follow-on Testing of NGATS Increment 1 Capability (provides Abrams/Bradley/Stryker support capability)</p> <p>Description: Complete developmental and operational follow-on testing activities</p> <p>FY 2016 Accomplishments: Initiated developmental and operational follow-on testing activities to include Reliability Testing, Logistics Demonstration/TM Verification and Transportability Testing in support of a production decision. Included also the assessment/verification of the development of remaining, needed capability of existing systems to operate with all existing test program sets used with legacy automatic test equipment.</p> <p>FY 2017 Plans: Continue and complete remaining required testing, assessment and verification events.</p>	1.000	0.800	-	-	-
<p>Title: Additional Software Capabilities for Use with NGATS</p> <p>Description: Develop software capabilities to incorporate common logistics operating environment/netcentric and embedded diagnostics data collection and analysis for closed loop diagnostic maintenance in support of condition-based maintenance</p> <p>FY 2016 Accomplishments: Continued development of a network centric software framework to facilitate configuration status accounting.</p> <p>FY 2017 Plans: Continue development of a network centric software framework to facilitate data exchange with other components of the global information grid (GIG).</p> <p>FY 2018 Base Plans: Develop new and emerging netcentric architecture. Develop software architecture that will define the transport protocol to interface to DoD common logistics environments and Logistics Modernization Program (LMP). Develop and improve data packages to include health management information.</p>	0.250	0.270	0.127	-	0.127
<p>Title: NGATS Performance Enhancement</p> <p>Description: NGATS core instrument/software modifications to increase NGATS performance</p> <p>FY 2016 Accomplishments:</p>	0.300	0.730	0.300	-	0.300

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / <i>Automatic Test Equipment Development</i>	Project (Number/Name) L59 / <i>Diagnost/Expert Sys</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continued development of NGATS core instrument/software modifications to increase NGATS performance to include redesign of the ATE interface perimeter engagement system. FY 2017 Plans: Complete prototype and evaluation of the redesigned perimeter engagement system and initiate development of increased processor speed with NGATS controller to add additional capabilities. FY 2018 Base Plans: Continue obsolescence identification and mitigation; continue analysis of system reliability and performance; identify bad actors and propose and integrate upgrades to increase readiness. Analyze new requirements from emerging weapons systems and implement system upgrades through hardware and software to meet platform testing requirements. Implement and test controller upgrade to increase processor speed to support Win10 implementation. Redesign cables for better logistic support and cost savings.					
Title: Abrams/Bradley Test Program Set (TPS) Design Description: Design, test and evaluate Abrams/Bradley TPSs to utilize modern core NGATS instrumentation vice continuing to execute on single-purpose instrumentation specifically developed to emulate Abrams/Bradley legacy test equipment (i.e., Direct Support Electrical System Test Set (DSESTS)) FY 2017 Plans: Redesign Abrams/Bradley TPSs to execute on core commercial NGATS instrumentation versus continuing to execute on single-purpose instrumentation specifically developed for testing Abrams/Bradley LRUs. FY 2018 Base Plans: Continue redesign of Abrams/Bradley TPSs to execute on core commercial NGATS instrumentation versus continuing to execute on single-purpose instrumentation specifically developed for testing Abrams/Bradley line replaceable units (LRU).	-	0.750	1.800	-	1.800
Title: Electro-Optic (EO) TPS Development Description: Develop Increment 2 and 3 EO TPSs for use with NGATS EO asset to utilize (Army standard) core NGATS instrumentation vice legacy automatic test systems such as DSESTS and Base Shop Test Facility (BSTF)(V)5 FY 2016 Accomplishments:	0.200	0.750	0.250	-	0.250

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / Automatic Test Equipment Development	Project (Number/Name) L59 / Diagnost/Expert Sys

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Initiated development of re-hosted EO TPSs to include 4 each Abrams/Bradley.</p> <p>FY 2017 Plans: Complete development of re-hosted EO TPSs to include 4 each Abrams/Bradley.</p> <p>FY 2018 Base Plans: Continue development of re-hosted EO TPSs to include 2 each CROWS and 2 each Stryker Remote Weapons Station.</p>					
<p>Title: NGATS Logistics Support Products</p> <p>Description: Develop NGATS initial logistics support products (including provisioning, technical manuals and calibration)</p> <p>FY 2016 Accomplishments: Initiated development of initial logistics support products for the NGATS EO and RF subsystems.</p> <p>FY 2017 Plans: Continue development of NGATS EO and RF logistics products and Abrams/Bradley TPS technical manuals.</p> <p>FY 2018 Base Plans: Complete development of NGATS EO and RF logistics products for use with the full-rate production NGATS.</p>	0.500	0.500	0.200	-	0.200
<p>Title: Maintenance Support Device (MSD) Technology Enhancements</p> <p>Description: Incorporate current relevant technology into the next-generation MSD and support capability enhancement of the wireless at-platform test set (WATS). Develop capabilities to minimize or eliminate Army dependency on proprietary software to support tactical vehicles and maintain compatibility with emerging platform hardware bus technology and software interface requirements.</p> <p>FY 2016 Accomplishments: Completed enhancement of WATS radio technology, the common electronics package augmentation and WATS architectural software shell to provide at-platform wireless test support for Army vehicle and weapon systems platforms. Continued to devise methods to minimize or eliminate Army dependency on proprietary software to support current and future tactical vehicles.</p> <p>FY 2017 Plans:</p>	0.864	0.234	0.633	-	0.633

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / <i>Automatic Test Equipment Development</i>	Project (Number/Name) L59 / <i>Diagnost/Expert Sys</i>

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Incorporate enhanced WATS radio technology, the common electronics package augmentation and new WATS software architecture into WATS prototype, conduct developmental testing, and develop draft Technical Data Package for at-platform wireless testing of Army vehicle and weapon systems platforms. Continue to investigate new methods to minimize or eliminate Army dependency on proprietary software to support current and future tactical vehicles. FY 2018 Base Plans: Design a modern vehicle data bus development tool, leveraging the new WATS design. The development tool will minimize the costs of connecting directly to vehicles. This tool allows for quicker and more complete functional testing, along with serving as a much more comprehensive tool for new equipment training. Develop MIL-STD-1553 software enhancements that maintain compatibility with emerging platform hardware bus technology.					
Title: NGATS Simulation Environment Description: Develop a simulation environment that will allow development and testing of TPSs on a desktop environment FY 2018 Base Plans: Initiate development of an NGATS simulation environment to allow TPS developers and contractors to develop and test TPSs on a desktop environment. Environment will allow for a cost-effective way to develop, maintain and troubleshoot TPSs off station. Develop desktop training environment for TPS developers and maintainers.	-	-	0.500	-	0.500
Title: TPS Development Environment Description: Develop a standardized TPS development environment for NGATS FY 2018 Base Plans: Initiate development on the C-Oriented Test Executive (COTE) TPS development software for NGATS. Develop test executive that is standard and compliant with DoD initiatives, framework working group and the Automatic Test Equipment Management Board (AMB). Standardized test executive will promote long-term maintainability of TPSs.	-	-	0.300	-	0.300
Title: Anti-Tamper/Cyber Security Description: Develop an Anti-Tamper/Cyber Security software capability for NGATS FY 2018 Base Plans:	-	-	0.191	-	0.191

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / Automatic Test Equipment Development	Project (Number/Name) L59 / Diagnost/Expert Sys
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Initiate development of Anti-Tamper/Cyber Security (AT/CS) software capability for NGATS. Continue to upgrade existing hardware and software with constantly changing security and information assurance requirements. Upgrade to Win10 operating system.					
Accomplishments/Planned Programs Subtotals	4.544	6.034	5.883	-	5.883

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>
• : OPA3, SSN MB4000, Integrated Family of Test Equipment (IFTE)	36.187	29.781	30.144	7.500	37.644	29.763	27.771	33.878	40.492	Continuing	Continuing

Remarks
None.

D. Acquisition Strategy
This developmental project consists of organic and contractual actions. When the necessary expertise and capability are available within the Department of Defense, services required for the individual development projects are ordered from the government source; otherwise, commercial contracts are used. Equipment required for developmental projects is obtained by contract from the commercial supplier. Developmental efforts for the Next Generation Automatic Test System (NGATS) are being completed under a number of contracts awarded to the prime contractor for the Integrated Family of Test Equipment off-platform testers and other contractors with automatic test equipment (ATE) and test program set development capabilities. NGATS is following an evolutionary acquisition strategy using incremental development to satisfy Army depot and field testing requirements for new and existing systems. It will replace existing legacy Army ATE (i.e., Base Shop Test Facility (BSTF)(V)3, BSTF(V)5, and Direct Support Electrical System Test Set) as well as Army depot system-specific ATE.

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 / 5					R-1 Program Element (Number/Name) PE 0604746A / <i>Automatic Test Equipment Development</i>				Project (Number/Name) L65 / <i>Test Equipment 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
L65: <i>Test Equipment Development</i>	-	4.092	2.779	2.461	-	2.461	5.950	4.773	4.157	4.284	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports development and demonstration of state-of-the-art calibration standards and techniques, and it upgrades/improves existing Army calibration systems. The project provides feasibility studies, market research, inventory analyses, bid sample testing, and prototyping to support calibration systems and general-purpose test, measurement and diagnostic equipment (TMDE) acquisitions. The primary effort of this project is development of calibration software; calibration capability for chemical, biological agent, radiation sourcing and detection systems; signal measurement and generation from direct current to microwave ranges; physical and mechanical measurements such as torque, pressure and temperature; and improvements in test and measurement equipment performance envelopes. This project provides for product improvements and development/evaluation of advanced technologies to increase reliability of calibration systems and general-purpose TMDE. The product improvements eliminate gaps in existing organic capabilities and ensure operational readiness, accuracy, effectiveness, and safety of Army weapons and combat support systems. These improvements employ reconfigurable open-electronics architecture and computer-based instrumentation where feasible and focus on reduced test equipment footprint to improve deployability and mobility in areas of operation.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Calibration Sets (CALSETS) Software Environment and Calibration	1.563	0.785	0.488	-	0.488
Description: Develop and test an Army automated calibration environment and develop calibration procedures. Test and evaluate automated test equipment software efforts in support of the Army risk management framework (RMF).					
FY 2016 Accomplishments: Continued development and evaluation of automated calibration procedures. Evaluated feasibility of incorporating commercial procedures and calibration system performance monitoring within the software environment. Tested and evaluated prototype calibration procedure development engine and RMF compliance.					
FY 2017 Plans: Initiate addition of ISO 17025 accreditation reporting to calibration software environment and calibration procedures. Develop and evaluate automated calibration procedures.					
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 / 5	R-1 Program Element (Number/Name) PE 0604746A / <i>Automatic Test Equipment Development</i>	Project (Number/Name) L65 / <i>Test Equipment Development</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Conclude development and evaluation of automated calibration procedures. Continue development and test of ISO 17025 accreditation reporting capability of the calibration software environment and calibration procedures. Continue test and evaluation of RMF compliance.					
<p>Title: Physical Instruments</p> <p>Description: Research, develop, and test physical parameter calibration instrumentation to support areas such as force, torque, radiological, chemical and biological agent detection systems, night vision testers, small arms gages, pneumatic pressure systems and temperature.</p> <p>FY 2016 Accomplishments: Continued development and test of prototype small arms gage calibration standards. Continued development and test of calibration systems for biological agent detectors and protective equipment. Concluded development of pneumatic standards to support avionic systems. Performed market research, evaluated commercial equipment, and completed specifications for temperature, force, torque and radiological standards.</p> <p>FY 2017 Plans: Continue development and testing of prototype small arms gage calibration standards. Continue development and test of calibration systems for biological agent detectors and protective equipment. Complete tests of pneumatic standards to support avionic systems. Perform market research, evaluate commercial equipment, and complete specifications for acquisition.</p> <p>FY 2018 Base Plans: Continue test and evaluation of force, torque, temperature, load sensor and radiological prototype standards. Conclude development and test of calibration systems for chemical and biological agent detectors and protective equipment.</p>	0.810	0.833	0.775	-	0.775
<p>Title: Electrical Instruments</p> <p>Description: Research, develop, and test electrical parameter calibration instrumentation to support areas such as deployable recertification set, intrinsic electrical standards, electrical transport standards and electro-optic calibration capability.</p> <p>FY 2016 Accomplishments: Performed market research, evaluated commercial equipment and developed performance specifications for acquisition. Completed development and test of high voltage multiplier for AC intrinsic voltage system.</p>	1.072	0.776	0.813	-	0.813

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / <i>Automatic Test Equipment Development</i>	Project (Number/Name) L65 / <i>Test Equipment Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Developed and tested prototype microwave reference standard. Initiated research and evaluation of electro-optic calibration capability.</p> <p>FY 2017 Plans: Perform market research, evaluate commercial equipment and develop performance specifications for acquisition. Continue development of prototype microwave reference standards. Research improvements in reliability, transportability and supportability of DC intrinsic voltage standards.</p> <p>FY 2018 Base Plans: Perform market research, evaluate commercial equipment and develop performance specifications for acquisition. Complete development and test of prototype microwave reference standards. Develop and test prototype systems that provide improvements in reliability, transportability and supportability of electrical voltage and electro-optic standards.</p>					
<p>Title: Test Equipment Modernization (TEMOD)</p> <p>Description: Perform market research, bid sample testing, and evaluation of commercial general-purpose electronic test equipment (GPETE) and develop performance specifications for TEMOD acquisitions.</p> <p>FY 2016 Accomplishments: Performed market research and evaluation of commercial GPETE and developed performance specifications for equipment to support acquisition program. Conducted bid sample testing to support acquisition program.</p> <p>FY 2017 Plans: Perform market research and evaluation of commercial GPETE and develop performance specifications for improved capability spectrum analysis test equipment. Conduct bid sample testing to support acquisition program.</p> <p>FY 2018 Base Plans: Perform market research and evaluation of commercial GPETE and validate performance specifications for improved spectrum analysis test equipment. Conduct bid sample testing to support acquisition program.</p>	0.647	0.385	0.385	-	0.385
Accomplishments/Planned Programs Subtotals	4.092	2.779	2.461	-	2.461

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604746A / Automatic Test Equipment Development	Project (Number/Name) L65 / Test Equipment Development

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 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>
• SSN N10000: Calibration Sets Equipment	4.650	4.963	5.564	-	5.564	8.515	4.459	3.964	4.022	Continuing	Continuing
• SSN N11000: Test Equipment Modernization	9.383	7.482	7.771	-	7.771	12.034	10.758	9.917	10.060	Continuing	Continuing

Remarks

D. Acquisition Strategy

Projects focus on commercial and nondevelopmental item technologies. Department of Defense services provide programmatic, engineering expertise and capability for individual development projects; otherwise, commercial service contracts are used to obtain required capabilities. Equipment required for development projects is obtained from commercial suppliers. Candidate commercial equipment and nondevelopmental items are identified and evaluated through market research and government test and evaluation.

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 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604760A / Distributive Interactive Simulations (DIS) - Eng 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	-	8.843	10.487	11.270	-	11.270	11.403	16.077	16.329	16.102	Continuing	Continuing
C74: Devel Simulation Tech	-	0.920	1.255	1.423	-	1.423	1.681	2.415	2.464	2.549	Continuing	Continuing
C77: Army Geospatial Data Master Plan	-	0.518	0.431	0.597	-	0.597	0.945	0.776	0.739	0.584	0.000	4.590
C78: One Semi-Automated Forces	-	7.405	8.801	9.250	-	9.250	8.777	12.886	13.126	12.969	Continuing	Continuing

A. Mission Description and Budget Item Justification

The program element "Distributive Interactive Simulations - Engineering Development" applies to the Army's Advanced Simulation Program, which enables operational readiness and the development of concepts and systems for the Future Force through the application of new simulation technology and techniques. The development and application of simulation technology will provide the means to link electronically a range of various simulation tools in a manner that is transparent to the user. The amalgam of simulations and tools is linked together to enable execution of an event; to verify the scenarios, tactics/techniques and procedures; to train testers on new hardware/software; and to conduct trial test runs before costly live field tests. The tools developed are available for reuse by developers and users of simulations throughout the Army.

Project C74 funds the HQDA-chartered mission of the Simulation-to-Mission Command Interoperability (SIMCI) Overarching Integrated Product Team (OIPT) in support of Army Training and Readiness. The SIMCI OIPT mission is to provide policy recommendations to Army senior leadership to improve organizations by allowing Soldiers to fight in the same manner in which they train. This is accomplished by interoperability between Mission Command (MC) systems and the Modeling and Simulation (M&S) systems the Army uses to stimulate MC systems for training Soldiers and their Leaders. SIMCI also invests in targeted solutions to critical problem areas that exist between MC and Simulations. The SIMCI OIPT, led by Program Executive Office (PEO) Simulation, Training, and Instrumentation (STRI) and PEO Command Control Communications-Tactical (C3T), uses focused collaborative processes among its 30+ Army organizations to identify key/critical interoperability shortfalls and the required materiel solutions.

Project C77, Army Geospatial Data Master Plan, focuses on activities that start with data acquisition from multiple sources and culminate in (1) accurate, robust and timely geospatial data and data management and (2) integration and conversion tools that support multiple battle command, training and mission-rehearsal applications. Project C77 continues development efforts associated with the Ground-Warfighter Geospatial Data Model (GGDM) and Geospatial Data Standards.

One Semi-Automated Forces (OneSAF) Project C78 develops and delivers a software application that represents activities of units and forces in simulation to support Army Training and Readiness. The application is used by Army agencies to support the concept evaluation, experimentation, materiel acquisition and training throughout the communities. The focus of this project is systems/software engineering and design for development and evolution of the architecture and software tools for a universal system of Army computer-generated forces -- OneSAF. OneSAF is a high fidelity brigade-and-below SAF that represents a full range of operations, systems and control processes in support of stand-alone and embedded training and Research, Development and Acquisition (RDA) simulation applications. OneSAF is fully

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604760A / <i>Distributive Interactive Simulations (DIS) - Eng Dev</i>
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interoperable with the Army's emerging virtual, live, and division-and-above constructive simulations and provides next-generation simulation products. OneSAF replaces a variety of legacy simulations used within the Army to support analytic and training simulation activities.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	9.138	10.487	10.847	-	10.847
Current President's Budget	8.843	10.487	11.270	-	11.270
Total Adjustments	-0.295	0.000	0.423	-	0.423
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.295	-			
• Adjustments to Budget Years	0.000	0.000	0.423	-	0.423

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604760A / <i>Distributive Interactive Simulations (DIS) - Eng Dev</i>				Project (Number/Name) C74 / <i>Devel Simulation Tech</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>C74: Devel Simulation Tech</i>	-	0.920	1.255	1.423	-	1.423	1.681	2.415	2.464	2.549	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project C74 funds the HQDA-chartered mission of the Simulation-to-Mission Command Interoperability (SIMCI) Overarching Integrated Product Team (OIPT) in support of Army Training and Readiness. The SIMCI OIPT mission is to provide policy recommendations to Army senior leadership to improve organizations by allowing Soldiers to fight in the same manner in which they train. This is accomplished by interoperability between Mission Command (MC) systems and the Modeling and Simulation (M&S) systems the Army uses to stimulate MC systems for training Soldiers and their Leaders. SIMCI also invests in targeted solutions to critical problem areas that exist between MC and Simulations. The SIMCI OIPT, led by Program Executive Office (PEO) Simulation, Training, and Instrumentation (STRI) and PEO Command Control Communications-Tactical (C3T), uses focused collaborative processes among its 30+ Army organizations to identify key/critical interoperability shortfalls and the required materiel solutions.

The SIMCI OIPT provides the following: (1) Advisor to Army Leadership--improve MC and M&S interoperability programs, policies, directives, resourcing, and procedures; (2) Technical Investment--sponsor/support initiatives that seek common solutions to critical interoperability issues surrounding MC and M&S systems; (3) Outreach--conduct & participate in interoperability outreach activities. SIMCI investments consist primarily of cost-sharing initiatives, leveraging initial system solutions of acquisition programs to enhance the interoperability of multiple systems in the Joint Operational Environment. SIMCI investments accelerate implementation within MC and M&S systems, of common data models and information exchanges that are used by other Services and coalition nations, thus enhancing the inherent ability of Army systems to interoperate seamlessly in a Joint, Interagency, Intergovernmental, and Multinational (JIIM) environment.

FY 2018 funding continues progress with embedding simulation into Mission Command Systems via the Ozone Widget Framework, continues management of the SIMCI OIPT's Army-wide collaborative, interoperability enhancement activities, including architecture alignment, data model alignment, common standards, components, and products. It is focused first on reducing costs and improving capabilities in the areas of automating Operational Plans, Orders, and Reports in support of Army, Joint, and Coalition operations. Objectives are: identify and articulate to HQDA senior leadership specific standards that require Army-wide implementation; co-develop data standards, architecture standards, implementation specifications and Joint/Coalition products; continue transition of SIMCI knowledge and proof-of-principle products to Army and Joint acquisition programs.

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

	FY 2016	FY 2017	FY 2018
Title: Program Management for the SIMCI Overarching Integrated Product Team (OIPT) Projects.	0.920	1.255	1.423
Description: Program Management of the SIMCI OIPT's Army-wide collaborative, interoperability enhancement activities, including architecture alignment, data model alignment, common standards, components, and products. The OIPT consists of a Product Director, engineers, and finance personnel.			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604760A / <i>Distributive Interactive Simulations (DIS) - Eng Dev</i>	Project (Number/Name) C74 / <i>Devel Simulation Tech</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p><i>FY 2016 Accomplishments:</i> Continued management and support of the SIMCI OIPT'S Army-wide collaborative, interoperability enhancement activities, including architecture alignment, data model alignment, common standards, components, and products. It is currently focused on gap-analysis of the current model and simulation programs and capabilities in the areas of Live, Virtual, and Constructive (LVC) simulations. Supported the Vice Chief of Staff of the Army's request to find redundancy within the Modeling and Simulation (M&S) community and reduce it. Objectives are to compare the current M&S capabilities with what will be required in the upcoming LVC-Information Assurance (LVC-IA) and Integrated Training Environment (ITE) environments, which will eventually become the STE in 2025. This will be Army-wide, as well as, Joint combined interagency products.</p> <p><i>FY 2017 Plans:</i> Will continue management and support of the SIMCI OIPT'S Army-wide collaborative, interoperability enhancement activities, including architecture alignment, data model alignment, common standards, components, and products. Will continue focus on gap-analysis of the current model and simulation programs and capabilities in the areas of Live, Virtual, and Constructive (LVC) simulations. This will support the Vice Chief of Staff of the Army's request to find redundancy within the Modeling and Simulation (M&S) community and reduce it. Objectives are to compare the current M&S capabilities with what will be required in the upcoming LVC-Information Assurance (LVC-IA) and Integrated Training Environment (ITE) environments, which will eventually become the Simulated Training Environment (STE) in 2025. This will be Army-wide, as well as, Joint combined interagency products. Focus on ITE with the creation of the blueprint for STE, which is slated to be implemented in 2025.</p> <p><i>FY 2018 Plans:</i> Will continue management and support of the SIMCI OIPT'S Army-wide collaborative, interoperability enhancement activities, including architecture alignment, data model alignment, common standards, components, and products. Will continue focus on gap-analysis of the current model and simulation programs and capabilities in the areas of Live, Virtual, and Constructive (LVC) simulations. This will support the Vice Chief of Staff of the Army's request to find redundancy within the Modeling and Simulation (M&S) community and reduce it. Objectives are to compare the current M&S capabilities with what will be required in the upcoming LVC-Information Assurance (LVC-IA) and Integrated Training Environment (ITE) environments, which will eventually become the Simulated Training Environment (STE) in 2025. This will be Army-wide, as well as, Joint combined interagency products. Focus on ITE with the creation of the blueprint for STE, which is slated to be implemented in 2025.</p>			
Accomplishments/Planned Programs Subtotals	0.920	1.255	1.423

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 / 5	R-1 Program Element (Number/Name) PE 0604760A / <i>Distributive Interactive Simulations (DIS) - Eng Dev</i>	Project (Number/Name) C74 / <i>Devel Simulation Tech</i>

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

Remarks

Currently SIMCI has no contract vehicle specific to their program. SIMCI uses other contract vehicles (internal/external) and awards money to work on specific technical projects. This provides the opportunity to leverage technical expertise from different agencies. SIMCI chooses projects that enhance current capabilities, closes the gaps of existing capabilities, and makes the determination for future projects that affect both the Mission Command and Live, Virtual, Constructive simulations environment. SIMCI only chooses those projects that meet specific requirements and criteria as stated above. It is one of SIMCI's missions to locate, utilize, or upgrade those projects or specific products that do just that.

D. Acquisition Strategy

SIMCI Overarching Integrated Product Team (OIPT) resources are allocated to multiple organizations in both the Mission Command (MC) and Modeling and Simulation (M&S) Communities. The funds are contracted to execute approved functions and to projects that advance the efforts of SIMCI and components-based architecture alignment. Products developed transition to the lead or sponsor's program which then maintains the product for the cost savings of itself and other programs in both Communities. The primary focus for these projects are the following: Embedded simulations with current Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) systems, gap-analysis for current simulations, and the proper implementation of Next-Generation modeling and simulation capabilities in regards to the Synthetic Training Environment (STE).

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 / 5					R-1 Program Element (Number/Name) PE 0604760A / <i>Distributive Interactive Simulations (DIS) - Eng Dev</i>				Project (Number/Name) C77 / <i>Army Geospatial Data Master Plan</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>C77: Army Geospatial Data Master Plan</i>	-	0.518	0.431	0.597	-	0.597	0.945	0.776	0.739	0.584	0.000	4.590
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project C77 addresses the implementation and acceleration of objectives focused on geospatial standards that were identified in the Army Geospatial Data Integrated Master Plan (AGDIMP), approved by the Chief of Staff, Army in April 2005 and newer guidance and directives including the Army's Geospatial Information Office (GIO) GIO Charter, Army Regulation for Geospatial Information and Services updated in 2014 (AR 115-11), and Army COE (Common Operating Environment (Implementation Plan's Geospatial Annex. The AGDIMP and the GIO charter, Geospatial Annex to COE IP, and AR 115-11 require the establishment of an enterprise architecture framed around geospatial standards that address geospatial/GEOINT data, services, and applications to enable the Army Geospatial Enterprise (AGE). This Army Geospatial Enterprise serves the Army's Programs/Systems, Organizations (most importantly our soldiers) to provide the geospatial foundation of accurate, robust, and timely geospatial data, robust tools and services that support mission command, intelligence, training, mission-rehearsal and other mission-applications. Project C77 addresses a geospatial/GeoINT standard-base framework that supports the ground-warfighter. This geospatial standard framework must also fit within the broader National System for Geospatial-Intelligence (NSG) and Allies Systems for GeoINT (ASG) architecture and standards. The establishment of a ground-warfighter, standards-based framework support the management, dissemination, and update of geospatial data and services from National systems and organization to tactical systems and ground-warfighter in an enterprise fashion that will minimal translation into unique and often proprietary data formats and internal application databases.

FY 2018 funding continues development efforts associated with the Ground-Warfighter Geospatial Data Model (GGDM) and Geospatial Data Standards.

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

	FY 2016	FY 2017	FY 2018
Title: Ground-Warfighter Geospatial Data Model (GGDM) formerly Army Geospatial Data Model (AGDM)	0.150	0.150	0.175
Description: The GGDM incorporates common data elements that conform to standards mandated by the Department of Defense Information Technology Standards Registry (DISR) for the National System for Geospatial Intelligence (NSG). Incorporating common geospatial data standards into the GGDM makes the Programs of Record (POR) consistent with new DISR-mandated geospatial intelligence standards for the NSG.			
FY 2016 Accomplishments: Completed the development of GGDM 3.0 and alignment with National System for GeoINT (NSG) NSG Application Schema) NAS 7.0. Will develop/enhance data translation tools from various Government geospatial data sources into GGDM and training materials to support translation of existing data into GGDM 3.0. Will build GGDM compliant geospatial database schema based			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604760A / <i>Distributive Interactive Simulations (DIS) - Eng Dev</i>	Project (Number/Name) C77 / <i>Army Geospatial Data Master Plan</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>upon NAS. Perform interoperability experiments with US Army, NGA, USMC and American-British-Canadian- Australian-New Zealand Allies</p> <p>FY 2017 Plans: Will develop/enhance GGDM tools including web enabling tools. Will develop additional training materials to support the use of GGDM. Will provide metadata tools to insure NSG compliance.</p> <p>FY 2018 Plans: Will continue development of GGDM to maintain alignment with National System for Geospatial-Intelligence (NSG) Application Schema (NAS) and will develop routing profiles based on GGDM. Will develop translational tools and incorporate new metadata standards to support NSG Metadata Foundation (NMF) and International Standards Organization (ISO) metadata standards for data discovery and interoperability.</p>				
<p>Title: Geospatial Data Standards</p> <p>Description: Army Geospatial Standards including data standards and standards for services to manage process and disseminate and utilize geospatial data.</p> <p>FY 2016 Accomplishments: Developed and maintained Geospatial Standards compliance matrix, Std-V1, in alignment with updated NSG standards and next cycle updates of DISR standards and coordinate results with Army Chief Info Officer (CIO/G6) and Asst. Sec. of Army Acquisition, Logistics & Tech ASA(ALT) Programs. Will develop enhancements to the Open Geospatial Consortium (OGC) Geopackage Standard to potentially include elevation data and routing data results in Version 2.0 of this standard. Will provide SME support on geospatial data and technology standard to Army Programs of Record (POR).</p> <p>FY 2017 Plans: Will work on standards and technology that support rendering and symbology rules to be incorporated in mobile and handheld applications. Will continue to maintain Geospatial Standards compliance matrix, Std-V1, in alignment with quarterly updated NSG standards and DISR cycle updates of GeoINT standards and coordinate results with Army CIO/G6 and ASA(ALT) Programs. Will provide SME support on geospatial data and technology standard to Army PORs.</p> <p>FY 2018 Plans: Will work on emerging standards and technology implementations to support to three-dimensional modeling and tiling capabilities and to update elevation data formats and services, focusing on support for mobile and handheld applications. Will continue to maintain Geospatial Standards compliance matrix, Std-V1, in alignment with quarterly updated NSG standards and DoD Information Technology Standards and Profile Registry (DISR) cycle updates of GeoINT standards and coordinate results with</p>		0.368	0.281	0.422

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604760A / <i>Distributive Interactive Simulations (DIS) - Eng Dev</i>	Project (Number/Name) C77 / <i>Army Geospatial Data Master Plan</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Army CIO/G6 and ASA(ALT) Programs. Will continue to provide SME support on geospatial data and technology standards to Army PORs.			
Accomplishments/Planned Programs Subtotals	0.518	0.431	0.597

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

N/A

Remarks

D. Acquisition Strategy

Resources are allocated to several critical geospatial projects in support of the Army Geospatial Data Integrated Master Plan (AGDIMP) and the Army Geospatial Enterprise (AGE).

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 / 5					R-1 Program Element (Number/Name) PE 0604760A / <i>Distributive Interactive Simulations (DIS) - Eng Dev</i>				Project (Number/Name) C78 / <i>One Semi-Automated Forces</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>C78: One Semi-Automated Forces</i>	-	7.405	8.801	9.250	-	9.250	8.777	12.886	13.126	12.969	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

One Semi-Automated Forces (OneSAF) develops and delivers a software application that represents activities of units and forces in simulation to support Army Training and Readiness. The application is used by Army agencies to support the concept evaluation, experimentation, materiel acquisition and training throughout the communities. The focus of this project is systems/software engineering and design for development and evolution of the architecture and software tools for a universal system of Army computer-generated forces -- OneSAF. OneSAF is a high fidelity brigade-and-below SAF that represents a full range of operations, systems and control processes in support of stand-alone and embedded training and Research, Development and Acquisition (RDA) simulation applications. OneSAF is fully interoperable with the Army's emerging virtual, live, and division-and-above constructive simulations and provides next-generation simulation products. OneSAF replaces a variety of legacy simulations used within the Army to support analytic and training simulation activities.

FY 2018 funding allows for continued development of the software product line by addressing OneSAF Pre-Planned Product Improvements (P3Is) as prioritized and approved by the Training and Doctrine Command (TRADOC). This funding also provides for the management of the infrastructure, equipment, laboratories, and processes needed to develop, test, and release the required product baseline.

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

	FY 2016	FY 2017	FY 2018
Title: Engineering and Manufacturing Development (EMD) phase contract activities for the One Semi-Automated Forces program.	4.755	5.951	6.300
Description: Continue EMD phase contract activities for the OneSAF program.			
FY 2016 Accomplishments: Developed software capabilities based on OneSAF Pre-Planned Product Improvements (P3Is) as prioritized and approved by TRADOC. Continued the software development of functionality that enhanced architectural services, components, synthetic environment and infrastructure of the OneSAF product Line and provided for software integration, test and release of Version 8.6.			
FY 2017 Plans: Will continue the development of software capabilities based on OneSAF P3Is as prioritized and approved by TRADOC. Will continue the software development of functionality that enhances architectural services, components, synthetic environment and infrastructure of the OneSAF Product Line and will provide for software integration, test and release of required software refreshes and Version 9.0.			
FY 2018 Plans:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604760A / <i>Distributive Interactive Simulations (DIS) - Eng Dev</i>	Project (Number/Name) C78 / <i>One Semi-Automated Forces</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
Will continue the development of software capabilities based on OneSAF P3Is as prioritized and approved by TRADOC. Will continue the software development of functionality that enhances architectural services, components, synthetic environment and infrastructure of the OneSAF Product Line and will provide for software integration, test and release of required software refreshes and Version 8.8.				
<p>Title: Government System Test and Evaluation for the One Semi-Automated Forces (OneSAF) program.</p> <p>Description: Government System Test and Evaluation for the OneSAF program.</p> <p>FY 2016 Accomplishments: Provided for the conducting of software, test, integration and release for Version 8.6. Provided support to the user community in conducting experiments and validation events as needed for integration into the Home Station Training federation, Network Integration events, and LVC applications.</p> <p>FY 2017 Plans: Will provide for the conducting of software, test, integration and release for Version 9.0. Will provide support to the user community in conducting experiments, analyses, and validation events for integration into the Home Station Training Federation, Network Integration Events (NIE), Battle Lab Collaborative Simulation Environment (BLCSE), and other LVC applications.</p> <p>FY 2018 Plans: Will provide for the conducting of software, test, integration and release for Version 8.8. Will provide support to the user community in conducting experiments, analyses, and validation events for integration into the Home Station Training Federation, Network Integration Events (NIE), Battle Lab Collaborative Simulation Environment (BLCSE), Multi Resolution Federation- Brigade (MRF-B) Enhanced, and other LVC applications.</p>		0.850	1.000	1.100
<p>Title: Government Program Management for the One Semi-Automated Forces (OneSAF) program.</p> <p>Description: Government Program Management for the One Semi-Automated Forces (OneSAF) program.</p> <p>FY 2016 Accomplishments: Provided program management, engineering and technical oversight, contract support, and travel for support of site surveys and Subject Matter Experts for the development of OneSAF.</p> <p>FY 2017 Plans: Will provide program management, engineering and technical oversight, contract support, and travel for support of site surveys and Subject Matter Experts for the development of OneSAF.</p> <p>FY 2018 Plans:</p>		1.800	1.850	1.850

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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 / 5	R-1 Program Element (Number/Name) PE 0604760A / <i>Distributive Interactive Simulations (DIS) - Eng Dev</i>	Project (Number/Name) C78 / <i>One Semi-Automated Forces</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Will provide program management, engineering and technical oversight, contract support, and travel for support of site surveys and Subject Matter Experts for the development of OneSAF.			
Accomplishments/Planned Programs Subtotals	7.405	8.801	9.250

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
• OMA: OMA, 121014000	4.704	4.922	5.086	-	5.086	6.915	6.975	7.117	7.276	Continuing	Continuing

Remarks

D. Acquisition Strategy

Continue the yearly release of the OneSAF Software (SW) versions containing performance enhancements resulting from the development and integration of both approved Product Improvements and integration of Co-Developer handovers. PM OneSAF continues to manage two Delivery Orders for the Development, Integration, Interoperability, and Support (I2S) of capabilities products, data, and documentation that fully serves the current and evolving needs of the user community.

The enhancements will be executed within the development line as modifications to the released baseline via Engineering Change Proposals (ECPs); Change Requests (CRs): Pre-Planned Product Improvements (P3I); and correction of deficiencies identified as Problem Test Reports (PTRs) and Deficiency Reports (DRs) by the user community.

In FY2018, the program office is pursuing a single award contract for the continuing development and maintenance of the software baseline.

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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604768A / <i>Brilliant Anti-Armor Submunition(BAT)</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	10.000	-	10.000	0.000	0.000	0.000	0.000	0.000	10.000
688: <i>ATACMS BLK II</i>	-	0.000	0.000	5.000	-	5.000	0.000	0.000	0.000	0.000	0.000	5.000
P01: <i>Multi-Mode Seeker Development and Test</i>	-	0.000	0.000	5.000	-	5.000	0.000	0.000	0.000	0.000	0.000	5.000

Note

This is a New Start.

A. Mission Description and Budget Item Justification

Army Tactical Missile System (ATACMS) is the United States (U.S.) Army's primary all-weather, surface-to-surface long-range artillery precision guided missile used by Combatant Commanders to shape the battlefield with long-range fires against hard & soft targets in open, complex, and urban environments.

FY2018 base dollars in the amount of \$10.000 million support ATACMS BLK II (Project #: 688) and the Multi-Mode Seeker (MMS) program (Project #: P01) which focus on development, integration & test of warheads and sensors to engage moving maritime & armored land-based targets.

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	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	10.000	-	10.000
Total Adjustments	0.000	0.000	10.000	-	10.000
• 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	10.000	-	10.000

Change Summary Explanation

FY 2018 funding change due to incorporation of effort to transition Strategic Capabilities Office (SCO) demonstrated capabilities to defeat moving armored and maritime targets.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604768A / <i>Brilliant Anti-Armor Submunition(BAT)</i>	Project (Number/Name) 688 / <i>ATACMS BLK II</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
688: <i>ATACMS BLK II</i>	-	0.000	0.000	5.000	-	5.000	0.000	0.000	0.000	0.000	0.000	5.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
This is a New Start.

A. Mission Description and Budget Item Justification

ATACMS BLK II will integrate Strategic Capabilities Office (SCO) Breaker program demonstrated capabilities into ATACMS. This effort focuses on providing ATACMS with integrated sensor & warhead technologies to engage moving land-based armored targets.

FY18 Base funds in the amount of \$5.000 million supports contract requirements package development, system analysis & evaluation, requirements & specification development, and program transition activities.

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

	FY 2016	FY 2017	FY 2018
Title: Transition of SCO demonstrated capabilities to defeat armored targets	-	-	5.000
Description: Conduct warhead component requirements development, system integration analysis, and transition planning targeted at rapid qualification and fielding of the armor engagement capability.			
FY 2018 Plans: Will begin contract requirements package development, system analysis & evaluation, requirements & specification development, and program transition activities.			
Accomplishments/Planned Programs Subtotals	-	-	5.000

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

N/A

Remarks

N/A

D. Acquisition Strategy

Accelerate the transition of Strategic Capabilities Office (SCO) Breaker program demonstrated capabilities into ATACMS.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604768A / <i>Brilliant Anti-Armor Submunition(BAT)</i>	Project (Number/Name) 688 / <i>ATACMS BLK II</i>

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 / 5	R-1 Program Element (Number/Name) PE 0604768A / <i>Brilliant Anti-Armor Submunition(BAT)</i>	Project (Number/Name) P01 / <i>Multi-Mode Seeker Development and Test</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>P01: Multi-Mode Seeker Development and Test</i>	-	0.000	0.000	5.000	-	5.000	0.000	0.000	0.000	0.000	0.000	5.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note

This is a New Start.

A. Mission Description and Budget Item Justification

Multi-Mode Seeker will integrate Strategic Capabilities Office (SCO) STRIKE-X program demonstrated capabilities into ATACMS. This effort focuses on providing integration of a seeker to search, detect, acquire, and engage moving maritime/land-based targets.

FY18 Base funds in the amount of \$5.000 million supports contract requirements package development, system analysis & evaluation, requirements & specification development, and program transition activities.

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

	FY 2016	FY 2017	FY 2018
Title: Transition of SCO demonstrated capabilities to defeat maritime targets	-	-	5.000
Description: Conduct seeker component requirements development, system integration analysis, and transition planning targeted at rapid qualification and fielding of the maritime engagement capability.			
FY 2018 Plans: Will begin contract requirements package development, system analysis & evaluation, requirements & specification development, and program transition activities.			
Accomplishments/Planned Programs Subtotals	-	-	5.000

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

N/A

Remarks

N/A

D. Acquisition Strategy

Accelerate the transition of Strategic Capabilities Office (SCO) STRIKE-X program demonstrated capabilities into ATACMS.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604768A / <i>Brilliant Anti-Armor Submunition(BAT)</i>	Project (Number/Name) P01 / <i>Multi-Mode Seeker Development and Test</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: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</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	-	20.808	15.068	18.566	-	18.566	19.601	20.415	17.361	10.962	Continuing	Continuing
571: <i>Close Cbt Tact Trainer</i>	-	0.725	0.998	0.937	-	0.937	0.845	0.836	0.536	0.000	Continuing	Continuing
577: <i>Gaming Technology In Support Of Army Training</i>	-	2.880	1.979	0.536	-	0.536	0.545	1.002	1.228	0.618	Continuing	Continuing
582: <i>Synthetic Envir Core</i>	-	16.035	9.322	11.513	-	11.513	10.077	10.179	10.221	10.344	Continuing	Continuing
585: <i>Aviation Combined Arms Tactical Trainer</i>	-	1.168	2.769	5.580	-	5.580	8.134	8.398	5.376	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Combined Arms Tactical Trainers (CATT) represent a family of combined arms simulation systems designed to support the Army's simulation-based, Combined Arms Training Strategy. The CATT program portfolio directly supports the Army's Training Strategy and progressive training model by providing realistic training events and comprehensive After Action Reviews (AAR). CATT enables units, from crew to the battalion task force level, to conduct a wide variety of combat tasks on a realistic, interactive, synthetic battlefield. CATT's combination of manned simulators and staff officer workstations enables units to train as a combined arms team in a cost effective manner. The primary CATT system is the Close Combat Tactical Trainer (CCTT) which provides the underlying baseline architecture and AAR for CATT expansions, Pre-Planned Product Improvements (P3I) and system enhancements. The Reconfigurable Vehicle Simulator (RVS) supports combat convoy operations and Improvised Explosive Devices (IED) tasks. Synthetic Environment (SE) Core provides for the expansion of the synthetic environment baseline to include enhanced interoperability and the products and infrastructure to support current and future combat operations and mission rehearsal required for Unified Land Operations. The first synthetic environments expanded were in the Aviation Combined Arms Tactical Trainer (AVCATT) and the CCTT for both the Active and Reserve components. Gaming Technology provides an application to train and rehearse convoy-operations, platoon level, mounted infantry tactics, dismounted operations, rules-of-engagement training, cross-cultural communications training, IED defeat training, route clearance, ground-air coordination, Unmanned Aerial Vehicle (UAV) integration, and other small unit and individual training and mission rehearsal requirements. Soldiers can train in a common environment on geotypical or geospecific virtual terrain. It is also possible to link Gaming technology to actual communication, command, control, computer, and intelligence (C4I) systems and other CATT simulation systems to increase the utility and realism of the training. By practicing skills in CATT, units are able to effectively prepare for costly live fire and maneuver exercises, as well as training tasks deemed too hazardous to conduct in a live training environment. Fielded in both fixed site and mobile versions, CATT enables both Active and Reserve component units to prepare for real world contingency missions. By being able to use a wide array of training terrain databases and modify the behavior of the computer generated opposing forces, CATT offers an unlimited array of training options to support the Army's many regional combat missions. The combination of tough field and live fire training, and realistic simulation training in CATT, is the formula to prepare Soldiers and their Leaders for the uncertainties they face in combat operations.

FY 2018 core funding of \$.937 million for CCTT enables gaming technology and visualization for maneuver training, and the P3I for the CCTT in order to reduce life cycle costs.

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>
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FY 2018 base funding of \$0.536 million will continue program management activities in conducting market research for future Engineering and Manufacturing Development (EMD) phase of GFT flagship replacement.

FY 2018 base funding of \$11.513 million will continue the efforts of providing development of the capability to produce common terrain databases to maintain concurrency with supported training systems. FY 2018 funds will continue modifying the Terrain Development process for constructive terrain databases, and continue to enhance OneSAF in the SE Core Architecture. Base funding also provides continuous development of new OneSAF capabilities for virtual simulations and enables interoperability with the Live, Virtual, Constructive Integrated Training Environment (LVC ITE); this is a cost avoidance for individual virtual simulators in that they do not develop and maintain separate Semi-Automated Forces (SAFs). SE Core will continue to upgrade, integrate and refine the Common Virtual Components, and continue to develop common visual models and transportation networks.

FY 2018 base funding of \$5.580 million for AVCATT will design and develop software to inter-operate with other training devices and simulators in a Common Operating Environment (COE). This is required to enable training with the Universal Mission Simulator, CCTT, Games For Training, and LVC-IA. Additionally, the base funding will be used to design and develop the replacement of the Image Generator system as part of hardware modernization.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	21.622	15.068	18.053	-	18.053
Current President's Budget	20.808	15.068	18.566	-	18.566
Total Adjustments	-0.814	0.000	0.513	-	0.513
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.814	-			
• Adjustments to Budget Years	0.000	0.000	0.513	-	0.513

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>				Project (Number/Name) 571 / <i>Close Cbt Tact Trainer</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
571: <i>Close Cbt Tact Trainer</i>	-	0.725	0.998	0.937	-	0.937	0.845	0.836	0.536	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Close Combat Tactical Trainer (CCTT) immersively and comprehensively trains Armor, Cavalry, Infantry, Mechanized Infantry, and Armored Reconnaissance units from squad through Battalion/Squadron level, to include their staffs. The primary training audience operates from full-crew simulators, reconfigurable command posts, and live battalion command posts to accomplish their combined arms training tasks. CCTT is a ground based, collective training device comprised of the CCTT and the Reconfigurable Vehicle Tactical Trainer (RVTT). CCTT is comprised of full fidelity, manned simulators for the M1 Abrams main battle tank, M2 Bradley Fighting Vehicles (BFV) variants, and Cavalry Fighting Vehicles (CFV). RVTT is a CCTT Reconfigurable Vehicle Simulator (RVS) comprised of full fidelity, manned simulators for the High Mobility Multipurpose Wheeled Vehicle (HMMWV) and Heavy Expanded Mobility Tactical Truck (HEMTT).

FY 2018 core funding of \$.937 million for CCTT enables: the continued development and integration of gaming technology, development of visualization technology, support of maneuver training, and the P3I to reduce life cycle costs.

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

	FY 2016	FY 2017	FY 2018
Title: Government Program Management for the Close Combat Tactical Trainer (CCTT) program.	0.125	0.163	0.166
Description: Government Program Management for the CCTT program.			
FY 2016 Accomplishments: Supported government program management, engineering, technical, contracting support, and continues operational evaluation support.			
FY 2017 Plans: Will support government program management, engineering, technical, contracting support, and will continue operational evaluation support.			
FY 2018 Plans: Will support government program management, engineering, technical, contracting support, and will continue operational evaluation support.			
Title: Engineering and Manufacturing Development (EMD) phase contract activity for CCTT, and Interoperability between CCTT.	0.600	0.835	0.771
Description: Continue EMD phase contract activities for CCTT.			
FY 2016 Accomplishments:			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 571 / <i>Close Cbt Tact Trainer</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Enabled the integration of gaming technology into CCTT in support of maneuver training for Armor Brigade Combat Teams. FY 2017 Plans: Will enable the continued development and integration of gaming technology; and development of virtualization technology into CCTT in support of maneuver training for Armor Brigade Combat Teams. FY 2018 Plans: Will enable the continued development and integration of gaming technology; and development of virtualization technology into CCTT in support of maneuver training for Armor Brigade Combat Teams.			
Accomplishments/Planned Programs Subtotals	0.725	0.998	0.937

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>
• OPA3, Appropriation NA0170: <i>OPA3, Appropriation NA0170</i>	45.210	59.771	45.718	-	45.718	47.135	51.430	39.503	1.274	Continuing	Continuing
• OMA, Appropriation 121018000: <i>OMA, Appropriation 121018000</i>	2.687	2.960	3.235	-	3.235	3.648	3.893	3.973	6.164	Continuing	Continuing

Remarks
The RDT&E efforts are essential to provide enhancements for the hardware and software of the program to meet warfighter mission priorities and validated requirements. These enhancements, after proper testing, will be procured and fielded with the programs procurement funds.

D. Acquisition Strategy
All CCTT development will utilize small business competitively awarded contract vehicles or agreements with the Army Research Laboratory (ARL) and other Army programs for support of research and 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 / 5					R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>				Project (Number/Name) 577 / <i>Gaming Technology In Support Of Army Training</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
577: <i>Gaming Technology In Support Of Army Training</i>	-	2.880	1.979	0.536	-	0.536	0.545	1.002	1.228	0.618	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Games for Training (GFT) Program prepares Soldiers and leaders for combined arms maneuver operations for Force 2025 and beyond in support of the Joint Force and allies with tailorable and scalable training and mission rehearsal capabilities. Gaming Technology provides an application to train and rehearse convoy-operations, platoon level, mounted infantry tactics, dismounted operations, rules-of-engagement training, cross-cultural communications training, IED defeat training, route clearance, groundair coordination, Unmanned Aerial Vehicle (UAV) integration, and other small unit and individual training and mission rehearsal requirements. The GFT program satisfies the Active, the National Guard, and the Army Reserves' educational requirements in the Operational, Institutional, and Self-Development Training Domains with a low-overhead, flexible, persistent training capability on geo-specific and geo-typical terrain that is relevant with all military platforms and weapon systems. GFT comprehensively trains Company and below formations to operate in today's dynamic combat environment. GFT trains higher multi-echelon units and staffs without troops to meet Combatant Commanders' requirements.

FY 2018 base funding of \$0.536 million will continue program management activities in conducting market research for future Engineering and Manufacturing Development (EMD) phase of GFT flagship replacement. The decision to pursue GFT Increment II capability was deferred.

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

	FY 2016	FY 2017	FY 2018
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Games for Training (GFT) program. Description: Continue EMD phase contract activities for the GFT program. FY 2016 Accomplishments: Funding provided modifications to the GFT system to ensure compliance with the LVC in support of Force 2025 and beyond. It also integrated new commercial and Government technology products into the current Gaming System. FY 2017 Plans: Funding will provide concurrency modifications to the GFT system to ensure integration compliance with Live, Virtual and Constructive simulations and Mission Command Systems in support of Force 2025 and beyond training. Funding will allow for Engineering and Manufacturing Development of the GFT system into Common Operating Environment (COE) for Data Cloud and Hand Held environments. Funding also provides market research for the GFT flagship replacement.	2.660	1.692	-
Title: Government Program Management for the GFT program. Description: Government Program Management for the GFT program.	0.220	0.287	0.536

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 577 / <i>Gaming Technology In Support Of Army Training</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p><i>FY 2016 Accomplishments:</i> Government program management, engineering, technical, contract and test activities provided integration of software, fielding, and web hosted support to U.S. Army Soldier tactical training.</p> <p><i>FY 2017 Plans:</i> Government program management, engineering, technical, contract and test activities will provide integration of software, fielding, and web hosted support to U.S. Army Soldier tactical training.</p> <p><i>FY 2018 Plans:</i> Government program management, engineering, technical, contract and test activities to support market research for future commercial and Government gaming solutions.</p>			
Accomplishments/Planned Programs Subtotals	2.880	1.979	0.536

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
• OPA 3: <i>OPA 3, Appropriation NA0176 Gaming Technology in Support of Army Training</i>	9.793	11.543	5.406	-	5.406	3.454	10.483	5.395	4.179	Continuing	Continuing
• OMA: <i>OMA, Appropriation 121018000, TCAT</i>	-	0.250	0.241	-	0.241	0.240	0.238	0.237	0.250	Continuing	Continuing

Remarks
OPA funding provides concurrency of the Virtual Battlespace 3 (VBS3) Flagship software license that provides the Army enterprise use rights. Additionally, funding provides for the procurement of new gaming hardware suites and gaming system refresh. The GFT program will also provide other commercial and Government off-the-shelf game software applications used to train Active, Reserve, and Army National Guard soldiers in a PC based, shared environment. OMA funding provides and supports Games for Training hardware and software Information Assurance (IA) and Risk Management Framework (RMF) requirements.

D. Acquisition Strategy
The acquisition strategy is to annually procure an Army-wide software license for a commercial or Government game based training system, Virtual Battlespace 3 (VBS3) and associated Games for Training system hardware that consists of a common desktop or laptop computer, headset, and peripherals. In support of concurrency initiatives to the COTS solution, the GFT program conducts development and integration activities for new models and visual concurrency into the VBS3 flagship software baseline.

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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 / 5	PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	577 / <i>Gaming Technology In Support Of Army Training</i>

The government awarded a single award, multiple year Firm Fixed Price contract with a single base year awarded in FY13 and option years exercised in FY14, FY15, and FY16. FY17 will be the final option year and will result in an Army wide perpetual license that will be used until procurement of the flagship replacement.

Efforts for flagship replacement gaming capability are currently being initiated for an FY19 start.

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 / 5					R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>				Project (Number/Name) 582 / <i>Synthetic Envir Core</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
582: <i>Synthetic Envir Core</i>	-	16.035	9.322	11.513	-	11.513	10.077	10.179	10.221	10.344	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the Synthetic Environment Core (SE Core) Program. SE Core's mission is to ensure the Army's training systems and simulators are integrated and interoperable in support of U.S. Army Readiness. SE Core provides virtual simulators with visual models (buildings and vehicles), terrain (over which the simulator moves), and entity behaviors (models performing realistic and appropriate actions such as movement and weapon effects) that are relevant and realistic to Force 2025 and beyond. The result is a "Fair Fight" capability; no simulator or operator will have an inherent advantage over another. Fair Fight allows for air and ground to have coordinated and integrated training events that accurately replicate combat operations. Additionally, SE Core is building the Army's Common Virtual Environment (CVE) that provides the linkage between simulators and establishes a common environment for interoperability, allowing various simulators to be linked together for a train-as-we-fight capability. SE Core is a foundational element in the Integrated Training Environment linking the embedded systems, multi-mode Live, Virtual, Constructive, Gaming (LVCG) training capability with current systems.

The SE Core components are Virtual One Semi-Automated Forces (OneSAF) integration; terrain database generation; common visual models; virtual systems architecture; a dynamic environment; and mission command development. A major SE Core component is the Standard Terrain Database Generation Capability (STDGC) process used to generate the synthetic terrain used in simulators and simulations. This terrain is a key component for virtual simulators and constructive simulations and will meet the demands of today's and future simulations.

FY17 base funding request decreased significantly from the PB16 submission due to a de-scoping of program requirements.

FY 2018 base funding of \$11.513 million will continue the development of the terrain generation capability for common terrain databases to maintain concurrency with supported training systems. FY 2018 funds will continue developing the terrain generation tools and process for constructive terrain databases, and continue to enhance OneSAF in the SE Core Architecture. Base funding also provides continuous development of new OneSAF capabilities for virtual simulations and enables interoperability with the Live, Virtual, Constructive Integrated Training Environment (LVC ITE); this is a cost avoidance for individual virtual simulators in that they do not develop and maintain separate Semi-Automated Forces (SAFs). SE Core will continue to upgrade, integrate and refine the Common Virtual Components, and continue to develop common visual models and transportation networks. Base funding will also begin development of new tools and processes needed to support the Dense Urban Terrain environment requirement.

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

	FY 2016	FY 2017	FY 2018
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Synthetic Environment Core (SE Core) program.	14.250	7.730	9.841
Description: Continue EMD phase contract activities for the SE Core program.			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 582 / <i>Synthetic Envir Core</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p><i>FY 2016 Accomplishments:</i> Increment 2 provided expansion of the terrain generation capability to meet the demand for synthetic terrain for training including constructive simulation and gaming. Efforts to improve interoperability across simulators and simulations continued to include transportation networks.</p> <p><i>FY 2017 Plans:</i> Continues to satisfy requirements in preparation to complete Increment 2. Efforts will automate the terrain generation capability to meet the demand for synthetic terrain for constructive and gaming training. Will also increase interoperability across simulators and simulations by improving subterranean capabilities and transportation networks.</p> <p><i>FY 2018 Plans:</i> Satisfy requirements necessary to initiate Increment 3. Efforts will continue to automate the terrain generation capability to meet the demand for synthetic terrain for constructive and gaming training. Will also continue to increase interoperability across simulators and simulations by improving subterranean capabilities and building interiors. Will begin development of new tools and processes needed to support the Dense Urban Terrain environment requirement.</p>				
<p><i>Title:</i> Government Program Management for the Synthetic Environment Core (SE Core) program.</p> <p><i>Description:</i> Government Program Management for the SE Core program.</p> <p><i>FY 2016 Accomplishments:</i> Provided program management, engineering and technical oversight, contract support, and travel for support of site surveys and Subject Matter Experts for the development of SE Core. Additionally, started acquisition management for the solicitation and evaluation for a new SE Core contract award.</p> <p><i>FY 2017 Plans:</i> Will provide program management, engineering and technical oversight, contract support, and travel for support of site surveys and Subject Matter Experts for the development of SE Core.</p> <p><i>FY 2018 Plans:</i> Will provide program management, engineering and technical oversight, contract support, and travel for support of site surveys and Subject Matter Experts for the development of SE Core under the newly awarded contract.</p>		1.785	1.592	1.672
Accomplishments/Planned Programs Subtotals		16.035	9.322	11.513

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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 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 582 / <i>Synthetic Envir Core</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, Appropriation, 121018000: OMA, Appropriation 121018000, TBWG	21.436	16.878	16.432	-	16.432	15.609	16.165	16.947	18.570	Continuing	Continuing

Remarks
OMA funds are used to generate and maintain the synthetic terrain, models, and virtual OneSAF for the Army's Integrated Training Environment (ITE) concept.

D. Acquisition Strategy

The SE Core program is post Milestone B and will remain in the Engineering and Manufacturing Development phase for the remainder of its lifecycle. SE Core is a "software only" program that continuously develops terrain, virtual models and other software products for integration into existing training systems. It does not field products to the end user, therefore the program will not require a Milestone C decision or go into the Production phase. The SE Core program is developing the software tools and processes to develop the Army's common virtual environment to link simulation devices (to include: CCTT, AVCATT, GFT, LVC-IA, HITS, JLCCTC, FIRESIM, OneSAF) into an interoperable environment and maintaining the synthetic terrain, models, and virtual OneSAF for the Army's Integrated Training Environment (ITE) concept.

The government awarded Increment 2 as a single award, cost plus fixed fee (CPFF), indefinite delivery indefinite quantity (IDIQ) contract to Leidos in August 2011 with a period of performance start date of December 2011. Leidos was formerly known as Science Applications International Corporation (SAIC). This contract has a one-year base with four one-year options. The government exercised the first option in December 2012, the second option in December 2013, the third option in December 2014 and the fourth option in December 2015. The government will award a final delivery order in December 2016 that extends the period of performance of the Increment 2 contract into December 2017.

In keeping with the original SE Core acquisition strategy of continuous development, the government intends to award the Increment 3 contract as a single award, CPFF, IDIQ contract in FY18. The contract will have a one year base and four one-year options with a target end date of 2022 to accommodate the extension of the program lifecycle by two years in order to support the Army's Integrated Training Environment.

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 / 5				PE 0604780A / Combined Arms Tactical Trainer (CATT) Core				582 / Synthetic Envir Core							
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
Management Services	Various	Various : Various	3.622	-		-		-		-		-	0.000	3.622	3.622
Government Program Management Support	Various	PEO STRI : Orlando, FL	22.018	1.785	Oct 2015	1.592	Nov 2016	1.672	Oct 2017	-		1.672	Continuing	Continuing	Continuing
Subtotal			25.640	1.785		1.592		1.672		-		1.672	-	-	-
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
Technology Development - Architecture and Integration	C/CPFF	SAIC : Orlando, FL	6.946	-		-		-		-		-	0.000	6.946	6.946
Technology Development -Architecture and Integration	C/CPFF	SAIC : Orlando, FL	50.785	-		-		-		-		-	0.000	50.785	50.785
Technology Development -Database Virtual Environment Development	C/CPFF	CAE, USA : Orlando, FL	56.179	-		-		-		-		-	0.000	56.179	56.179
Technology Development-Common Virtual Environment & Management	C/CPFF	Leidos : Orlando, FL	55.025	14.250	Dec 2015	7.730	Dec 2016	-		-		-	0.000	77.005	0.000
Technology Development-Common Virtual Environment & Management INC III	C/TBD	ACC-Orlando : Orlando, FL	0.000	-		-		9.841	Nov 2017	-		9.841	0.000	9.841	0.000
Subtotal			168.935	14.250		7.730		9.841		-		9.841	0.000	200.756	113.910

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 582 / <i>Synthetic Envir Core</i>
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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			
Technology Development - Test Support	Various	Test Community : Various	0.125	-		-		-		-		-	0	0.125	0.125
Subtotal			0.125	-		-		-		-		-	0.000	0.125	0.125

Remarks
Not Applicable

	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	194.700	16.035		9.322		11.513		-		11.513	-	-	-

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 582 / <i>Synthetic Envir Core</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
Increment 2 (Development and Integration)																												
Increment 3 (Development and Integration)																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 582 / <i>Synthetic Envir Core</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Increment 2 (Development and Integration)	4	2013	1	2018
Increment 3 (Development and Integration)	1	2018	1	2023

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>				Project (Number/Name) 585 / <i>Aviation Combined Arms Tactical Trainer</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
585: <i>Aviation Combined Arms Tactical Trainer</i>	-	1.168	2.769	5.580	-	5.580	8.134	8.398	5.376	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Aviation Combined Arms Tactical Trainer (AVCATT) is Army Aviation's only Collective Training Program of Record for Active, Reserve, and Army National Guard Aviation Units. AVCATT enables unit collective and combined arms air-ground training for AH-64, UH-60, CH-47, OH-58, and UH-72 aircrews within the Live, Virtual and Constructive (LVC) Integrated Training Environment (ITE). The AVCATT also supports the training of Non-Rated crew members in crew coordination, flight, aerial gunnery, hoist, and slingload related tasks via the Non-Rated Crew Member Manned Module (NCM3); which can be linked to AVCATT's UH-60, CH-47, and UH-72 cockpit configurations to support a unit's specific Mission Training Requirements.

FY2018 base funding for AVCATT will design and develop software to inter-operate with other training devices and simulators in a Common Operating Environment (COE). This is required to enable training with the Universal Mission Simulator, CCTT, Games For Training, and LVC-IA. Additionally, the base funding will be used to design and develop the replacement of the Image Generator system as part of hardware modernization.

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

	FY 2016	FY 2017	FY 2018
Title: Government Program Management for the Aviation Combined Arms Tactical Trainer (AVCATT) program.	1.168	0.185	0.104
Description: Government Program Management for the AVCATT program.			
FY 2016 Accomplishments: Supported government program management, engineering, technical, contracting support, and continues operational evaluation support.			
FY 2017 Plans: Will support government program management, engineering, technical, contracting support, and continues operational evaluation support.			
FY 2018 Plans: Will support government program management, engineering, technical, contracting support, and continues operational evaluation support.			
Title: Engineering and Manufacturing Development (EMD) phase contract activity for the Aviation Combined Arms Tactical Trainer (AVCATT) program.	-	2.584	5.476

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 585 / <i>Aviation Combined Arms Tactical Trainer</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Description: Continue EMD phase contract activities for the AVCATT program.			
FY 2017 Plans: Will complete the design, development, and testing for the first article test for a virtualized AVCATT manned module architecture in order to reduce the current computer hardware footprint in preparation for FY18 planned hardware modernization.			
FY 2018 Plans: Will complete development and testing for new interfaces and protocols for the system to inter-operate with other training devices and simulators in a Common Operating Environment (COE). Will begin design and development of upgraded image generators in preparation for FY20 planned hardware modernization.			
Accomplishments/Planned Programs Subtotals	1.168	2.769	5.580

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
• Other Procurement, Army: OPA3, Appropriation NA0173 Aviation Combined Arms Tactical Trainer	30.068	40.000	30.568	-	30.568	25.281	31.062	32.430	42.191	Continuing	Continuing
• Operations and Maintenance, Army: OMA, Appropriation 121018000 Aviation Combined Arms Tactical Trainer	0.100	-	-	-	-	-	-	-	-	0	0.100

Remarks

D. Acquisition Strategy

The government awarded a single award, cost plus fixed fee (CPFF), indefinite delivery indefinite quantity (IDIQ) contract to Applied Visual Technologies, a minority owned, small disadvantaged business, in December 2012. The period of performance of the base contract is through December 2017. Additional tasks are exercised through delivery orders which each have multiple options for development. The most recently awarded RDTE effort was on the fourth delivery order, awarded in September 2014, which included options for gunnery enhancements, integrated data modem development, training environment virtualization, aviation mission planning software development, maintenance tool kit development, manned unmanned teaming, and AH-64E concurrency development.

The government awarded a single award, CPFF, IDIQ services contract to Cole Engineering Services, Inc, a small business, in September 2015. The period of performance of the base contract is through September 2020. The third task order, awarded in June 2016, included hardware modernization development and Windows 10 research and testing.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604780A / <i>Combined Arms Tactical Trainer (CATT) Core</i>	Project (Number/Name) 585 / <i>Aviation Combined Arms Tactical Trainer</i>

AVCATT utilizes small business competitively awarded contract vehicles when able. Currently small businesses are conducting development for dynamic terrain enhancements, NCM3 development, and training effectiveness analysis.

The AVCATT program is post Milestone C. Although the system is in the production phase, continuous research, development, testing, and engineering is required in order to maintain concurrency with the real world aircraft and systems that the AVCATT simulates in the virtual training environment. The AVCATT program has fielded the full base order of issue of 23 suites but continues to release incremental hardware and software upgrades at approximate semiannual intervals.

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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</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	-	96.286	146.655	145.360	-	145.360	128.742	126.304	118.970	129.154	Continuing	Continuing
DY3: <i>NIE Test & Evaluation</i>	-	10.768	65.844	58.395	-	58.395	61.482	49.699	45.735	50.051	Continuing	Continuing
DY4: <i>Network Integration Support</i>	-	13.700	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	13.700
DY5: <i>Production/Field Coordination for Capability Sets</i>	-	3.486	3.960	4.261	-	4.261	4.349	4.434	4.524	4.502	Continuing	Continuing
DY6: <i>Brigade and Platform Integration Support</i>	-	44.164	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	44.164
DY7: <i>Army Systems Engineering, Architecture & Analysis</i>	-	15.802	14.166	15.508	-	15.508	15.998	25.121	25.499	26.214	Continuing	Continuing
DZ6: <i>Army Integration Management & Coordination</i>	-	8.366	5.746	6.775	-	6.775	6.922	7.065	7.217	7.367	Continuing	Continuing
FG7: <i>Emerging Technology Initiatives</i>	-	0.000	56.939	60.421	-	60.421	39.991	39.985	35.995	41.020	Continuing	Continuing

Note

Project FG7 Emerging Technology Initiatives was created in support of the Army Rapid Capabilities Office (RCO). This project will be realigned to PE 0605054A Emerging Technologies Initiatives in FY 2019 for greater transparency of the Army RCO efforts.

A. Mission Description and Budget Item Justification

This program element is comprised of five projects: Network Integration Evaluation (NIE) Test and Evaluation; Production/Field Coordination for Capability Sets; Army Systems Engineering, Architecture & Analysis; Army Integration Management & Coordination; and Emerging Technology Initiatives. The specific evaluation requirements will support Mission Command Network 2020, Force 2025 objectives, and emerging technology insertion.

Project DY3: Network Integration Evaluation (NIE) Test & Evaluation, synchronizes, integrates, and manages system and System of Systems (SoS) network capability evaluations in laboratory and operational environments in order to inform Army force modernization decisions that impact network improvements, interoperability compliance, operational readiness, and exploitable technology opportunities.

Project DY4: Network Integration Support, the mission requirements and the funding to support those requirements have been moved to DY3; NIE Test & Evaluation to increase transparency of evaluation efforts and cost.

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>
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Project DY5: Production/Fielding Coordination for Capability Sets, provides for the development of a synchronized Brigade/Division level plan for the Production equipment delivery and Fielding (hand-off logistics and new equipment training) of Capability Set (CS) components (both hardware/software in A and/or B Kits) upon completion of Network Integration Evaluation (NIE), Army Interoperability Certification (AIC) and Army CS fielding decision.

Project DY6: Brigade and Platform Integration Support, the mission requirements and the funding to support those requirements have been moved to DY3; NIE Test & Evaluation to increase transparency of evaluation efforts and cost.

Project DY7: Army System Engineering, Architecture & Analysis, provides the Army's leadership and materiel developers with the necessary modernization planning, System of Systems (SoS) engineering, technical analysis, architectural products, critical path analysis, and risk analysis and mitigation planning to influence the Army's materiel portfolio. This project also explicitly funds Cyber Security engineering, architecture and development tasks necessary to create effective, affordable and secure network capabilities that address critical gaps, meet Mission Command Network (MCN) 2020 objectives and/or Force 2025 and Beyond (F2025B) initiatives. Integration of Army defensive/offensive cyber and Position, Navigation, and Timing (PNT) capabilities into the overall CS design, Multinational/Mission Partner Environments architecture development at both the tactical and enterprise levels, network modernization risks/gaps for Corps level units and below, and Army spectrum strategy.

Project DZ6: Army Integration Management & Coordination, provides for all "shared" functions (Human resources, Budget development and executions, Acquisition, Operations, Program Coordination, Facilities management) and headquarters functions that supports the technical aspects of the Network integration, Platform integration, Brigade Integration and the Production Integration and coordination and synchronized fielding teams.

Project FG7: Emerging Technology Initiatives, will fund prototyping and demonstration of selected technology enabled capabilities to defeat emerging threats against ground, aviation, command, control, communications & reconnaissance systems and equipment, precision weapons, and Soldier equipment. Funding facilitates maturation and demonstration of emerging technologies and systems in relevant varied environments and tactical/operational scenarios. The focus is to mature technologies with a goal of initial production, limited fielding, and transition to a Program of Record in an Army or DoD Program Management Office.

B. Program Change Summary (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	99.242	89.716	101.538	-	101.538
Current President's Budget	96.286	146.655	145.360	-	145.360
Total Adjustments	-2.956	56.939	43.822	-	43.822
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.955	-			
• Adjustments to Budget Years	-0.001	0.000	-16.599	-	-16.599

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>
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• Emerging Technology Initiatives (FG7) line added	0.000	56.939	60.421	-	60.421
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Change Summary Explanation

FY 2017 program change reflects the additional funding in the amount of \$56.939 Million supports Army's Rapid Capabilities Office (RCO) efforts under project FG7.

FY 2018 program change reflects the additional base funding in the amount of \$60.421 Million to support the Army's Rapid Capabilities Office (RCO).

FY 2018 program changes also reflect funding reductions from projects DY3 (-8.916) and DY7 (-8.668), as well as, additional funding in support of projects DY5 (1.162) and DZ6 (0.823).

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>				Project (Number/Name) DY3 / <i>NIE Test & Evaluation</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
DY3: <i>NIE Test & Evaluation</i>	-	10.768	65.844	58.395	-	58.395	61.482	49.699	45.735	50.051	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project DY3: Network Integration Evaluation (NIE) Test & Evaluation, synchronizes, integrates, and manages system and System of Systems (SoS) network capability evaluations in laboratory and operational environments in order to inform Army force modernization decisions that impact network improvements, interoperability compliance, operational readiness, and exploitable technology opportunities.

There are two planned integration events annually: a NIE and a Joint Warfighting Assessment (JWA) [formerly known as an Army Warfighting Assessment (AWA)]. The NIE will focus on assessments of Program of Record (PoR) capabilities in support of synchronized Capability Set (CS) fielding of network systems. The JWA will focus on Force 2025 concepts; interoperability & Army Warfighting Challenges (AWFCs); and emerging capabilities.

These funds support the following major efforts associated with each event:

- Planning: planning, coordination, and scheduling with multiple stakeholders participation and resourcing of personnel, services, equipment and prototypes, and other deliverables needed for lab based risk reduction (LBRR), network and platform integration, training, field support and logistics, and event battle rhythm/schedule.
- Engineering and Architecture: developing SoS architecture, operational threads, engineering design packages, configuration management, and network data products as well as analyzing network performance and validating CS architecture products with independent evaluations of Program Executive Offices (PEO)- and Program Manager (PM)-sponsored solutions and services proposed for CS19-23 fielding activities.
- LBRR: executing risk reduction for SoS NIE/JWA network architecture designs in controlled laboratory environments in order to minimize integration, configuration and interoperability issues that may be encountered during field events.
- Integration: building Golden Vehicles for safety release, performing Brigade platform installation, instrumentation, and checkout, validating the network, and Information Assurance certifications.
- Execution: technical and logistics support during soldier-led evaluation, data collection, trouble ticket analysis and closeout, and battle rhythm and field support management.
- Close-out: inventorying platforms, de-installing equipment, returning platforms to their original configurations, updating documentation, and reporting (to include feedback to industry on technology performance).

These funds are also used for procuring equipment and materials (to include prototypes, when required), event infrastructure, Satellite Communications, field services, personnel (government and contractor), and travel.

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

	FY 2016	FY 2017	FY 2018
Title: NIE Test and Evaluation Costs	6.568	-	-
Description: These funds provide for planning and conducting detailed experiments, tests and evaluations of potential Network, Software and Hardware systems for procurement and integration into the Army's Warfighter system.			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</i>

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

FY 2016 Accomplishments:

Two major events occurred in FY 2016: NIE 16.2 and AWA 17.1.

For NIE 16.2, the organization designed, engineered, and integrated network components, subsystems, and systems onto 26 Golden Vehicles (GVs) and successfully completed safety assessments for 12 platforms in order to ensure their safe operation by soldiers. Following the GV effort, the organization successfully integrated and completed quality and validation checks on 220 Fleet vehicles used by the Brigade Combat Team during the NIE. After completion of the formal evaluation event, the Capability Package Directorate (CPD) demod-ed and returned 220 vehicles to the 2/1 AD BCT.

The organization also completed test planning, coordination of requirements, asset planning, range planning, and soldier planning. Conducted test planning and management which included coordination of requirements with Army Evaluation Center (AEC), Operational Test Command (OTC), and White Sands Missile Range (WSMR), for formal evaluations of Systems Under Test (SUTs), and the Brigade Modernization Command (BMC) for Doctrine, Organization, Leadership, and Materiel (DOTLM) assessments of Systems Under Evaluation (SUEs), Risk Reduction efforts, and Demonstrations . This coordination included development and procurement of modeling and simulation tools, instrumentation for data collection, facilities required to store and maintain equipment, facilities required to integrate capabilities, other test equipment, and REDFORCE systems. Conducted safety and operational assessments, data collection, data analysis and report development. Conducted experimentation, tests, and evaluation by coordinating and procuring range resources to include range time, range personnel, test engineering support, operators and subject matter experts on systems under evaluation. Includes costs of management of the test/experiment and support all experiments and tests.

Also included costs for distributed networking capability (i.e. Defense Research Engineering (DREN), I/O Range, circuits, etc.) and other electronic infrastructure data transfer medias between Aberdeen Proving Ground (APG), Electronic Proving Ground (EPG), FT Bliss and White Sands Missile Range. Conducted coordination with AEC on the development of System Evaluation Plans (SEP) and Operational Milestone Assessment Reports (OMAR) and maintain all data bases of evaluation analysis. Conduct Red/Blue Force Team Cyber assessments in the lab and in the field.

For NIE 17.1, the organization designed, engineered, and integrated network components, subsystems, and systems onto 25 Golden Vehicles (GVs) and successfully completed safety assessments for 10 platforms in order to ensure their safe operation by soldiers. Following the GV effort, the organization successfully integrated and completed quality and validation checks on 102 Fleet vehicles used by the Brigade Combat Team during the AWA. After completion of the formal evaluation event, the Capability Package Directorate (CPD) demod-ed and returned 102 vehicles to the 2/1 AD BCT.

The organization also completed planning and coordination of requirements, asset planning, integration and vehicle support planning, range planning, and soldier planning with JMC personnel as well as representatives of three multinational partners: the UK, Canada, and Australia. CPD also coordinated with BMC and WSMR to support Doctrine, Organization, Leadership, and Materiel (DOTLM) assessments of Systems Under Evaluation (SUEs), Risk Reduction efforts, and Demonstrations. Includes costs of management of the test/experiment and support all experiments and tests.

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 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
Also included costs for distributed networking capability (i.e. Defense Research Engineering (DREN), I/O Range, circuits, etc.) and other electronic infrastructure data transfer medias between Aberdeen Proving Ground (APG), Electronic Proving Ground (EPG), FT Bliss and White Sands Missile Range. Conducted coordination with AEC on the development of System Evaluation Plans (SEP) and Operational Milestone Assessment Reports (OMAR) and maintain all data bases of evaluation analysis. Conduct Red/Blue Force Team Cyber assessments in the lab and in the field.				
Title: Other Support Cost Description: Other Support Cost required for NIE/AWA Events. FY 2016 Accomplishments: Procured and managed satellite time, POL, security support, facilities, MEDEVAC support, blade time for helicopters, and others services, equipment and maintenance of facilities to ensure a successful evaluation/test. Coordinated and processed receipt and recovery of 220 vehicles for NIE 16.2 and 102 vehicles for AWA 17.1.		4.200	-	-
Title: Integrated Evaluations Description: These funds enable evaluations/assessments of network capabilities in laboratory and operational environments across the Army battlespace to assess the systems, SoS, and integrated network performance and inform system development and fielding decisions. These funds support event planning, engineering and architecture, LBRR, network and platform integration, event execution, and event close-out. FY 2017 Plans: These funds provide for: - AWA 17.1 close-out. This support consists of: performing detailed analysis of up to 2000 SIF trouble tickets to identify System, and/or System of Systems, trends that manifested themselves during any given phase of the AWA, and publishing a formal report. - NIE 17.2 and AWA 18.1 planning and preparation. Support listed here is common to both events, unless otherwise noted, and will consist of: - For each event, providing technical input on platform Size Weight and Power (SWAP) constraints or restrictions that must be considered for placement of candidate systems in the Horse Blanket; participation in Bull Pen sessions to; finalize candidate system parameters and characteristics needed for platform/system engineering designs; verify accreditation status for all network systems; identify supporting hardware and software requirements; and finalize delivery schedules for the respective events; conduct planning and coordination for Tier 1 Integrated Master Schedule (IMS), as well as development of lower tier schedules		-	64.959	55.934

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</i>

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

	FY 2016	FY 2017	FY 2018
<p>for integration; complete the development of Engineering Design packages (drawings, diagrams, manuals) and Bills of Materials (BOMs) for integrating system A/B Kits on up to 250 tactical platforms, (This includes development of up to 50 Prototype (Golden) Vehicles (GV) and for NIE 17.2 only, engineering design packages also include instrumentation needed for System-Under-Test data collection); complete the development of Network Engineering designs, plans, and schedules for integrating and configuring on up to 3000 C4ISR systems, to include baseline and legacy systems, enabling these systems to join and operate on the network; complete the implementation of Configuration Management (CM) for up to 250 Tactical Platform architectural implementations, engineering designs, A-Kits, B-Kits, and the Integrated Master Schedules; procure up to 20,000 materials, fasteners, cables, components, and other items needed for installing NIE/AWA systems on up to 250 tactical platforms; fabricate of up to 1,000 special cables and up to 1,000 metal plates, racks, and brackets, needed for system installation on up to 250 platforms; coordinate hardware and software system deliveries to the Integration Motor Pool (IMP) at Fort Bliss, TX; provide access control and badging for IMP and field operations for up to 5000 personnel; conduct planning and Coordination with BMC for developing and issuing Operational Orders (OPORDS), Fragmentary Orders (FRAGOS), and other directives, for 2/1 AD, and other Unit, support.</p> <p>- For NIE17.2 only, coordination with CS design teams for CS-19 equipment baseline implementation: To ensure equipment and network interface designs support the CS-19 architecture, CS-19 training support requirement, to establish the methods to be followed for informing the CS design teams on CS-19 issues and/or trends, to address Integrated Logistics System (ILS) requirements, and capture Lessons Learned in the form of After Action Reviews, Technical Reports, and Feedback on CS-19 systemic issues encountered during Integration, conduct field Based Risk Reduction testing for up to 4 complex platform builds, and preparation of up to 50 integrated platforms (25 for AWA 18.1) for safety release testing.</p> <p>- IMP operations for each event, including; Administrative support for up to 600 Program Managers (PMs), Original Equipment Manufacturers (OEMs), and Field Service Representatives (FSRs) Office space, Internet access, conferencing, etc., managing and coordinating technical support, during GV design, and during GV/Fleet Build for up to 500 FSRs and OEMs, packaging and shipping up to 200 packages of components and equipment and receiving up to 4000 packages of equipment, components and materials, warehousing up to 2,000 pieces of equipment and up to 20,000 components and materials, supporting inspection teams for up to 250 tactical platforms delivered for subsequent integration, managing up to 250 Tactical Platforms, including movement into IMP High Bays, security for the IMP and for technical field support bases, enforce safety standards, conduct hazardous waste management, support installation teams for up to 250 tactical platforms, conduct System of System Checkouts on over 400 platforms, to verify all installed systems and equipment interoperate with each other, as well as with legacy C4ISR/Vehicular Systems, conduct QA/QC checkouts for up to 250 integrated platforms.</p> <p>- For each event, coordinate New Equipment Training (NET) Quality Control and Scheduling, provide troubleshooting support for integration related issues/problems during the Validation and Communications Exercise phases (VALEX and Garrison COMMEX),</p>			

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

	FY 2016	FY 2017	FY 2018
<p>Utilization of Single Interface to the Field (SIF) failure reporting and corrective action system (FRACAS), for generating trouble tickets and assigning technical support teams to resolve problems or issues reported during VALEX.</p> <p>- For NIE 17.2, Coordinating with System Owners, vendors, and Brigade Modernization Command (BMC), for NET Training Package development and delivery. Coordinating with BMC and with System owners/vendors for scheduling and providing NET for up to 1,000 soldiers. Perform detailed analysis of up to 2000 SIF trouble tickets to identify System, and/or System of Systems, trends that manifested themselves during any given phase of the NIE, and publishing a formal report, develop and publish up to 20 formal technical reports for C4ISR systems integrated and installed as part of the NIE.</p> <p>- For AWA 18.1, NET support outlined above is only provided for Networked Systems. Non-Networked systems NET support is TRADOCs responsibility.</p> <p>- NIE17.2/AWA 18.1 Execution/Closeout: For each event, establishing field operations for Technical Support teams to operate from during Field COMMEX and Event Execution, provide field support will include a Higher Control (HICON) element, two Regional Support Teams (RSTs), and up to six Unit Support Teams (USTs), ensure that the HICON, RSTs, and USTs is strategically emplaced throughout the NIE footprint to enable technical support teams to respond to, and resolve, problems reported by soldiers in the field, ensure utilization of SIF FRACAS, managed at the HICON, for generating trouble tickets and assigning technical support teams to resolve problems or issues reported by the soldiers, and establishing logistics cells at the IMP and at strategic locations in the NIE footprint, enabling rapid response times for spare parts and components needed to repair and resolve NIE system issues while the Unit is in the field, de-modifying integrated C4ISR systems from up to 250 platforms and returning those platforms to their original configurations, oversee the updating and finalizing up to 50 engineering design drawings based on the outcomes of VALEX, Garrison COMMEX, Field COMMEX, and Event Execution.</p> <p>- After each event, recovery of up to 250 Tactical Platforms back to the CPD Integration Motor Pool (IMP), at Fort Bliss, Texas.</p> <p>- NIE 18.2 Early Planning: Provide technical input on platform SWAP constraints or restrictions that must be considered for placement of candidate systems in the Test Brigade Horse Blanket, participate in Bull Pen sessions to: finalize candidate system parameters and characteristics in order to support platform/system engineering designs; verify accreditation status for all network systems; identify supporting hardware and software requirements; and finalize delivery schedules for the respective events and conduct the planning and coordination for Tier 1 Integrated Master Schedule (IMS), as well as development of lower tier schedules for integration.</p> <p>- NIE Network Integration and Validation: Funds provide for loading, establishing, integrating, and validating that the Network Integration Evaluation / Army Warfighter Assessment (NIE/AWA) network is stable, and that NIE/AWA networked systems, are</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>integrated on tactical platforms, and can join and operate on the NIE/AWA network. It supports all activities associated with planning, coordination, preparation, and execution of Network Validation Exercises (VALEX) for NIE 17.2 and AWA 18.1, as well as planning, coordination, and preparation for VALEX during AWA18.2. Once Platform Integration for NIE 17.2 and AWA 18.1 is complete, Capability Package Directorate (CPD) conducts VALEX to verify and demonstrate that integrated networked systems are properly configured and loaded to operate on the NIE network. At the same time CPD also verifies and validates the overarching NIE/AWA network is stable and operating nominally, prior to being handed over to BMC and 2/1 AD for NIE/AWA execution.</p> <p>- For each event, Capability Package Directorate's Trail Boss teams (consisting of Government and Contractor personnel), along with Platform Integration engineers and technicians, and ILS personnel, perform intensive planning and coordination leading up to the VALEX: oversee the planning and coordinating for; the Integration Motor Pool (IMP) layout for Command Posts and for integrated and legacy platforms that will be involved in VALEX, working to identify and resolve security issues associated with running classified/Coalition networked operations at the IMP, Data Products needed to load, configure, and initialize NIE/AWA networked systems and the underlying network devices (routers, switches, drivers, etc.), securing Information Assurance Accreditations for all networked C4ISR systems, including baseline and legacy systems, conduct coordination with; Lab Based Risk Reduction representatives for development of priority technical mission threads that will be used to validate the NIE network, ensure the development of; the battle rhythm (VALEX activities, meetings, technical forums for problem identification and resolution, leadership updates, etc.) for VALEX teams to follow during actual VALEX execution. The development of Network and Interconnecting Diagrams that are critical for defining networked system configurations, routing schemes, and routing architectures for networked systems and devices and Spectrum Plan for allocating and de-conflicting operating frequencies for all radiating systems involved in the NIE/AWA, including all NIE/AWA systems and all legacy systems.</p> <p>- For NIE 17.2 only, planning and coordination with ATEC to verify installed instrumentation is properly configured for data collection.</p> <p>For each event, unless otherwise noted, execute and provide technical support for each of the VALEX major phases:</p> <p>- During the LOADEX phase, CPD Trail Boss teams, working with Program of Record (POR) representatives, Legacy System Field Service Representatives (FSRs), and Vendor FSRs, and other key stakeholders, perform the following functions: Install networked system's hard drives, operating system software, software applications, and firmware on up to 2500 systems, Set IP addresses and configure all network systems, and load and initialize Radio Mission Plans, System configuration files and system parameters on up to 400 platforms. For NIE 17.2 only, load software on up to 250 instrumentation packages and configure as required for data collection. Perform test/fix/test processes at the system and component levels.</p>			

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	FY 2016	FY 2017	FY 2018
<p>- During the ESTABLISH phase, CPD Trail Boss teams, working with vendor FSRs, Legacy FSRs, and POR technical representatives, and other key stakeholders, perform the following functions: Verify networked hardware and software performance at the platform level, troubleshoot issues associated with network system configurations, Verify each integrated platform can perform its mission while operating on the NIE network. These activities typically involve up to 400 ESTABLISH tasks.</p> <p>- During the INTEGRATE phase, CPD trail boss teams, working with vendor FSRs, Legacy FSRs, and POR technical representatives, and other key stakeholders, perform the following functions: Verify networked hardware and software performance and networked communications at each echelon (i.e., between platforms and soldiers at the Platoon Level), as well as between echelons, all the way up to the Brigade level, and at echelons above Brigade, Troubleshoot any issues between units and at each echelon, and ensure tactical units information exchange enables units to support their intended missions.</p> <p>- For NIE 17.2 only, verify instrumentation is operational and is collecting and storing data as required. These activities typically involve up to 400 INTEGRATE tasks, and continue providing over-the-shoulder training for Soldiers who will be using the new BCT network during the NIE.</p> <p>During the VALIDATE phase, CPD trail boss teams, working with vendor FSRs, Legacy FSRs, and POR technical representatives, and other key stakeholders, execute up to 40 mission threads to: route messaging and information along specified critical nodes on the NIE/AWA Network, enabling operational missions to be executed by the soldiers, demonstrate the NIE/AWA Overarching Network's ability to enable the BCT commander to utilize key capabilities that rely on the network such as Networked Services (Server-Client Systems such as CPOF, Intel, VOIP conferencing, etc.)</p> <p>For NIE 17.2 only, ensure instrumentation is properly configured for capturing and logging data, enabling ATEC and TRADOC assessments and evaluations.</p> <p>- Lab Based Risk Reduction (LBRR) to support Integrated Evaluations: These funds provide SME to plan, coordinate, integrate and execute the risk reduction for the full System of Systems network/ architecture designs in the Network Integration Evaluation (NIE) and Army Warfighter Assessment (AWA) in controlled environments to minimize integration, configuration and interoperability risk in the events. LBRR efforts are used to: reduce risk in the Network Integration Evaluation (NIEs) 17.2 and the Army Warfighter Assessment (AWA) 18.1 and planning for 18.2, coordinate logistics and equipment delivery of resources planned for LBRR, build, integrate and configure the System of Systems network architecture in the lab using actual Program of Record hardware and COE software in preparation for risk reduction execution. Configuration also includes support for loading of the actual NIE/AWA data products for validation, lead and coordinate the NIE/AWA System of Systems testing between external sites participating in risk reduction, develop. The risk reduction plan includes: functional testing, routing, thread testing, as well as the design of the lab network in order to effectively represent the NIE/AWA architecture to provide for AWA and NIE executions. Provides SME during AWA and NIE execution to help design the network configuration and address any network issues. This is</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>done in the lab and in the field. LBRR personal also interface with PORs to ensure their successful integration into the network. It also leverages network resources to conduct network analysis efforts to improve future Army networks, end states, in support of future AWAs and NIEs, executes blue teaming/red teaming and other cyber tasks to inform on early Network Cyber requirements, provides lab evaluations of POR and demonstration systems and reports on how they meet Network 2020 or Force 2025B requirements and supports the management of trouble tickets and test incident reports for configuration management of testing issues to effectively report resolved and outstanding items as LBRR transitions into the Validation Exercise (VALEX).</p> <p>- Network Architecture & Thread Development to support Integrated Evaluations: These funds provide SME to coordinate the NIE/AWA 17.2, 18.1 and 18.2 architecture planning & development to meet all event test and evaluation objectives. Lead the documentation of the overall NIE/AWA network architecture and technical System of System threads.</p> <p>- These funds also provides for: collaboration with BMC, ATEC & G3/5/7 on the development of the detailed System of Systems Architecture to meet all evaluation and operational test requirements. Detailed development includes node by node systems planning, to build NIE/AWA Horse Blankets, lead Focused End States and other factors in forward planning and candidate assessments of the NIE/AWA Strategic Planning Review (SPR), Co-lead the NIE/AWA 17.2 and 18.1 Bullpen Sessions to ensure all architecture systems meet stakeholder evaluation requirements and finalize the NIE/AWA Horse Blanket, development of the detailed SoS Network Architecture in the form of the Transport View Diagrams and designing and maintaining the System of Systems Technical Threads of the NIE/AWA 17.2 and 18.1 in order to show operational use cases applied over the NIE/AWA. Development activities include leading the Critical Design Reviews of individual threads with both material/Program Manager (PM) and TRADOC stakeholders. It supports: LBRR during the thread risk reduction event and PM CP during the Validation Exercise (VALEX) during NIE/AWA 17.2 and 18.1 leading the coordination of individual thread validations to show SoS interoperability within the integrated architecture after all network integration and configuration have completed and it also supports maintaining the current custom scripts that enable data migration between the ARCADIE-derived Horse Blanket spreadsheet and the MagicDraw tool that is used to diagram the Transport View and Technical Threads deck.</p> <p>- System of Systems (SoS) Network Performance Analysis to support Integrated Evaluations: These funds provide the Subject Matter Expertise to execute diverse and independent portfolio of Network System of Systems performance analyses involving multiple-PEO systems (C3T, IEW&S, Soldier, GCS, STRI) and their cross-PEO integration which enables key acquisition-level decisions, Mission Command network (MCN) Capability portfolio reviews (CPRs), it also enables capability set (CS) architecture product Courses of Action COAs development and validation and provides Army Acquisition Executives (AAEs) and OSD with independent evaluations of PEO/PM solutions and services.</p> <p>- These funds also enable SMEs to conduct Transport Convergence of Intel/C2/Logistics/Medical performance analysis and network performance requirements development (all C4ISR/EW PEOs), Integrated Network Performance Assessments (INPA) of</p>			

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

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<p>NIE 17.2 and AWA 18.1, and assessments of Current and Future Network Cyber vulnerabilities and provide recommendations for solutions and/or architectural changes to resolve and/or mitigate them. Enduring analytical capabilities that enable these analysis will also be strengthened and standardized, to include: Army real-time OSD-metrics-driven Big Data performance analytics and Mission Essential / Mission Enhanced (MEME) operational impact assessment methodology (aka from technical to operational).</p> <p>- NIE /AWA and Alternate Venue Planning (Module 1-3): These funds provide for strategic planning to solicit and synchronize candidates and objectives for NIE and AWA bi-annual events. It establishes initial objectives, solidifies the architecture baseline and will establish a viable candidate list for Network Integration Evaluation (NIE) and Army Warfighter Assessment (AWA). Addresses planning for operational assessments to occur at venues other than NIE or AWA. Complete test planning, coordination of requirements, assets planning, and soldier planning.</p> <p>It supports the compilations of potential solutions that could meet the Army's Mission Command gaps and the US Army Training and Doctrine Command (TRADOC) identified opportunities. It includes the coordinated efforts between System of Systems Integration (SOSE&I), ASA(ALT) Program Executive Offices, Deputy Chief of Staff G3/5/7, Brigade Modernization Command (BMC) Ft Bliss and the Army Test and Evaluation Command (ATEC). Project also includes the initial integration phase where Systems Under Test (SUT) and government/industry System Under Evaluation (SUE) hardware and software are integrated and initially evaluated for follow-on consideration for lab assessments. These funds provide for planning detailed experiments, tests and evaluations of potential Network, Software and Hardware systems for procurement and integration into the Army's Warfighter system. Effort to solicit and select capabilities for inclusion in the NIE and AWA bi-annual events supporting Army's Network 2020 Endstates and Objectives and Forces 2025 beyond. Effort includes correspondence to NIE and AWA Participants, consolidation, analysis and publishing post-event reports and findings, analyze and consolidate event findings and development of implementation plans and to develop and maintain NIE and AWA specific Integrated Master Schedule (IMS). Effort to finalize the architecture, requirements, and horseblanket for each NIE and AWA and maintains horseblanket and IMS under formal CM processes, incorporates analysis and architecture objectives to influence CS fielding, facilitating platform reviews. Customers include HQDA G-3/5/7, G-8. TRADOC, ASA(ALT) PEOs, CIO/G-6, ATEC, deploying units, industry partners.</p> <p>- These fund also provide for the following: stakeholder Synchronization, Gatekeeper Management, Horse Blanket Initial development and analysis, Gov/Industry Solicitation, participant proposal evaluation, participation coordination, consolidation of stakeholder reports, individual final report generation to participants, incorporation of AWA results into PoR initiatives (.1 feedback loop to .2), cross directorate analysis and reporting, Alternate Venue planning, TSARC outcomes analysis, Implementation Memoranda, and Strategic Planning Review event planning and execution, Bull Pen event planning and execution.</p> <p>- MCN2020 Focused End State Alignment: These funds provide SMEs to analyze and coordinate identified PoRs on the NIE roadmap to achieve Mission Command Network 2020 End States and Objectives. It provides the Army's leadership and materiel developers with the necessary Capability Set (CS) modernization planning, critical path analysis, risk analysis and mitigation</p>			

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<p>planning, system of systems engineering (SOSE), technical analysis and architectural products to inform the Army's materiel portfolio (5 to 10 year plans). Lead and facilitate planning of long term Engineering & Architecture objectives across multiple PORs for support of MCN 2020 Objectives and Focused End States.</p> <p>- System of Systems (SoS) Network Performance Analysis: These funds provide the Subject Matter Expertise to execute diverse and independent portfolio of Network System of Systems performance analyses involving multiple-PEO systems and their cross-PEO integration which enables key acquisition-level decisions, Mission Command network (MCN) Capability portfolio reviews (CPRs), it also enables capability set (CS) architecture product Courses of Action COAs development and validation and provides Army Acquisition Executives (AAEs) and OSD with independent evaluations of PEO/PM solutions and services. It also funds conducting: cross-PEO Network System of System (SoS) performance analysis which includes the following key tasks and activities, CS20-22 reference architecture (IBCT, ABCT) performance validation/prediction analysis, to include operational impact assessment of the proposed architectural COAs, and sustainment improvement analysis, assessments of Position, Navigation and Timing (PNT) solution performance.</p> <p>- Network Integration Evaluation Long-range Investment Requirements Analysis (LIRA): These funds provide SMEs to develop LIRA for NIEs and evolution to Capability Integration Evaluations after FY 2020. It provides the Army's leadership and materiel developers with the necessary Capability Set (CS) modernization planning, critical path analysis, risk analysis and mitigation planning, system of systems engineering (SOSE), technical analysis and architectural products to inform the Army's materiel portfolio (5 and 30 year plans). Short and long term planning for evaluation and evolution of Network and Capability Integration evaluations after FY 2020.</p> <p>- Cyber support to Integrated Evaluations: The funds are provided to manage the NIE cyber security project including the NIE Authority to Connect (ATC) process and risk analysis for the Operational Test Network (OTN). Establish and maintain cybersecurity policies for NIE including a complete refresh of the cybersecurity Smartbook. It also includes: continually tracking accreditations for Capability Sets, champion certification and accreditation (C&A) impacts to scheduling and coordinating all cybersecurity activities for NIE/AWA including red, blue, and green team activities; ensure activities are funded through NIE Gatekeepers, coordinate threat briefing to the AO and all assessment out-briefs.</p> <p>- Strategic support to Platform in Integration Evaluation (SsP-IE): These funds provide for the advance collaboration and coordination with platform and network system Product/Project/Program Managers (PMs) to ensure Capability Set (CS) fielding platform integration design decisions are based on CS Reference Architecture products for CS16-22 to be evaluated in Network Integration Evaluation (NIE) events. Develop the Unit-specific architecture.</p>			

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<p>- SsP-IE: CS16 Products and Services: Close out of CS16 platform integration activities for the design of current and future Army network technologies in Army vehicle systems for evaluations at NIE 14.1 and 14.2 and finalize leveraging NIE technical data packages, network trend analysis, architecture, vehicle designs, platform integration challenges, strategic planning, Validation Exercise (VALEX) and SharePoint data sharing.</p> <p>- SsP-IE: CS17 Products and Services: Direct the design and integration of current and future Army network technologies in Army vehicle systems for evaluations at NIE 15.1 and 15.2. Define platform integration requirements for CS17 baseline NIE 15.1 and 15.2 evaluations, leveraging NIE technical data packages, network trend analysis, architecture, vehicle designs, platform integration challenges, strategic planning, Validation Exercise (VALEX), and SharePoint data sharing. Evaluate, synchronize and monitor platform and network system integration risks and mitigation plans for CS17 Unit specific Architectures in collaboration and coordination with platform and network system PMs. Evaluate, synchronize and monitor platform and network system program acquisition schedules, integration costs, and system requirements across organizations for the development of production ready A&B-kit Interface Control Documents (ICDs) and Level II Technical Data Packages (TDPs) supporting CS17 Unit specific baseline evaluations in collaboration and coordination with platform and network system PMs. Evaluate, synchronize and monitor PM implementation of Vehicle Integration for Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR)/ Electronic Warfare (EW) Interoperability (VICTORY) standards in Unit specific Architecture products.</p> <p>- SsP-IE: CS18 Products and Services: Define platform integration requirements for CS18 baseline NIE evaluation; leveraging NIE technical data packages, network trend analysis, architecture, vehicle designs, platform integration challenges, strategic planning, VALEX, and SharePoint data sharing. Evaluate, synchronize and monitor platform and network system Size, Weight and Power (SWaP) assessment of CS18 Unit specific Architectures in collaboration and coordination with platform and network system PMs. Support platform Original Equipment Manufacturer (OEM) design and integration activities for NIE and CS baseline events. Evaluate, synchronize, and monitor PM implementation of VICTORY standards in Initial and CS18 Unit specific Architecture products.</p> <p>-SsP-IE: Products and Services: Direct the design and integration of current and future Army network technologies in Army vehicle systems for evaluations at NIE 16.2 and 17.1. Define platform integration requirements for CS19-22 baseline NIE evaluation; leveraging NIE technical data packages, network trend analysis, architecture, vehicle designs, platform integration challenges, strategic planning, VALEX, and SharePoint data sharing. Evaluate, synchronize and monitor the development of the final CS19-22 Reference Architectures products defined by NIE evaluation results in collaboration and coordination with SoSE&I Engineering and Integration (E&I) and the Synch Fielding (SF)-Engineering Division. Evaluate, synchronize and ensure platform integration requirements are embedded</p>			

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<p>in the performance scope for SoSE&I managed SUE production RFPs In collaboration and coordination with platform PMs, network system PMs and the SoSE&I Integration Planning Division. Support platform OEM design and integration activities for NIE and CS baseline events.</p> <p>- These funds also provide Subject Matter Expertise for contract and budget management support to NIE17.2 and NIE/Army Warfighter Assessment (AWA) 18.1.</p> <p>FY 2018 Plans: Overview: These funds provide for Planning, Preparation, Execution, and Close-out for two planned evaluation events (JWA 18.1 and NIE 18.2); and initial planning and procurement of long lead items for the next event (JWA 19.1). For both events, Planning, Platform Preparation, Execution and Close-out are expected to occur at the unit's home station. Required program management, engineering, and vehicle integration resources will deploy to the unit's home station to integrate network systems onto brigade platforms and validate network performance. The evaluation execution will then take place. At the conclusion of the NIE/JWA, the unit and integration team will demod platforms and return them to baseline configuration. Support listed below is common to both events unless otherwise noted and consists of the following activities. Planning: These funds provide for coordination with Training and Doctrine Command (TRADOC), Headquarters, Department of the Army G-3/5/7, and Assistant Secretary of the Army for (Acquisition, Logistics, & Technology) ASA (ALT) PEOs to align capabilities/ technologies to Focused End States (FES) for each event. Support development and implementation of Horseblanket architecture and engineering analysis of design requirements and platform Size, Weight, and Power (SWaP) constraints that may impact inclusion of proposed systems in the event architecture. Conduct detailed planning sessions ("Bullpens") to finalize system parameters and characteristics needed for platform/system engineering designs, determine and verify network accreditation status, identify supporting hardware and software requirements, finalize product delivery schedules, and synchronize the Integrated Master Schedule (IMS) with all lower tier integration schedules. These funds support planning for the network Validation Exercise (VALEX) to support the operational exercise. This effort includes developing a VALEX site plan, assigning unit locations within the VALEX location; identifying and resolving security issues associated with running classified and/or coalition network operations; validating all Information Assurance Accreditations for networked C4ISR systems, and developing of technical mission threads used to validate the network. These funds also support development of Network Architecture, Transport View, and Interconnecting Diagrams that are critical for defining the network system configurations, routing schemes, and architectures for networked systems/devices, as well as a spectrum plan to allocate and de-conflict operating frequencies. Event Preparation:</p>			

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

	FY 2016	FY 2017	FY 2018
<p>These funds support efforts leading up to the execution of the Evaluation exercise to include LBRR, design refinement, Bill of Material (BOM) development, Configuration Management (CM), integration material procurement and manufacturing, Golden Vehicle (GV) build, safety release, Fleet build, VALEX, management of field support representatives (FSR) and products to be evaluated.</p> <p>The LBRR risk reduction efforts for the NIE and AWA are conducted in controlled laboratory environment to identify and resolve integration, configuration and interoperability issues prior to the operational events. LBRR efforts use PoR hardware/software, validated communications threads, and the data products to ensure the network effectively represents the event networks. Test products delivered by the LBRR document the results of network functional testing, routing, and thread testing.</p> <p>These funds also provide LBRR SMEs on-site VALEX support to conduct analysis efforts designed to improve future Army networks and end states, and oversee blue/red teaming.</p> <p>These funds further refine the engineering design packages (drawings, diagrams, and other guides/documentation); development of Bills of Material (BOMs) needed to support integration of an estimated 3000 Command, Control, Communications, and Computer Intelligence, Surveillance, and Reconnaissance (C4ISR) systems and their A/B Kits on to approximately 250 tactical platforms; Configuration Management (CM) for the event network architecture, all platforms, systems, system of system engineering designs, A-Kits, B-Kits, and the IMS; management of the Authority to Connect (ATC) process; risk analysis for the Operational Test Network (OTN); Procurement of approximately 20,000 items (e.g., fasteners, cables, components, Prototypes (as required), and other items) needed to support NIE/AWA; and fabrication of approximately 1,000 specialized cables, metal plates, racks, and brackets to enable platform installation/integration.</p> <p>These funds also enable design, integration, and safety release testing of Prototype or Golden Vehicles (GV) [NIEs average 50 GVs and AWAs require approximately 25 GVs] and Fleet build of approximately 250 tactical platforms. For each event, the scope of the integration effort includes management of approximately 500 Field Service Representatives (FSRs) that support all installation teams, coordination and movement of the Fleet vehicles, inventory management of systems, instrumentation, and integration material.</p> <p>Following completion of platform integration efforts, these funds support a structured network VALEX consisting of four subordinate efforts: Load Exercise (LOADEX), ESTABLISH, INTEGRATE, and VALIDATE.</p> <ul style="list-style-type: none"> • LOADEX; Installation of network system hard drives, operating system software, software applications, and firmware on up to 3000 systems. Set Internet Protocol (IP) addresses and configure all network systems; load and initialize radio mission plans, system configuration files and system parameters on up to 400 platforms; and perform test/fix/test processes at the system and component levels. • ESTABLISH; Verification of networked hardware and software performance at the platform level. Troubleshoot issues associated with network system configurations and verify that each integrated platform can perform its mission while operating on the network. • INTEGRATE; Verification of networked hardware/software performance and networked communications at each echelon. <p>Troubleshoot any issues found and ensure tactical unit information exchange will enable units to support their intended missions.</p>			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Ensure instrumentation is operational, collecting data, and storing the data as required. Provide over-the-shoulder training for Soldiers.</p> <ul style="list-style-type: none"> • VALIDATE; Execution of up to 40 mission threads to verify the correct routing of messages and information transfer among critical nodes in the network. For Systems Under Test, ensure instrumentation is properly configured for capturing and logging data, enabling Army Test and Evaluation Command (ATEC) and Training and Doctrine Command (TRADOC) assessments and evaluations. <p>Coordination with System Owners, vendors, and Joint Modernization Command (JMC) for New Equipment Training (NET) training package development/delivery and manage training for approximately 1,000 soldiers.</p> <p>Platform integration and VALEX efforts may encompass coordination with CS design teams. Funding will ensure equipment and network interface designs support the CS architecture; verify CS training support requirements; establish methods for informing CS design teams on issues and/or trends; address Integrated Logistics System (ILS) requirements; and capture lessons learned from After Action Reviews (AARs), Technical Reports, and Feedback on CS issues.</p> <p>Evaluation Event Execution:</p> <p>Funding supports all field operations of approximately 500 FSRs and 50 CPD personnel that provide support to the unit during the events and coordination with ATEC and TRADOC. It also includes monitoring of network operations in the field, trouble ticket management, continued LBRR support to troubleshoot technical issues, data capture and analysis, red/blue team cyber support, deployment of mobile facilities, and replacement parts/components required to effectively complete detailed evaluations.</p> <p>Closeout:</p> <p>These funds support all activities associated with the de-installation and recovery of network systems, components, A-kits, cabling installed on platforms, and restoration of platforms to baseline configurations. Removal, inspection, repair/replacement, shipping, and storing of all materiel and infrastructure used to enable the unit to execute the event. Analyze data and publish reports on how well systems performed and recommendations for future fielding. Conduct AARs for process improvements.</p> <p>Future Planning:</p> <p>These funds support efforts to provide technical input on candidate systems at the Technical Interchange Meetings, Concepts and Capabilities Review Board, and Strategic Planning Reviews for future events. Funding also supports Network SoS performance analyses of future CS reference architectures, performance validation, predictive analysis (to include operational impact assessment of the proposed architectural COAs), sustainment improvement analysis; and assessments of Position, Navigation and Timing (PNT), Cyber, Electronic Warfare solutions performance.</p>				
<p>Title: Infrastructure and other support</p> <p>Description: Provides for setup, utilities, furniture, equipment and maintenance (of all equipment and facilities) used by SoSE&I (CPD) in support of Network Integration Evaluations (NIE) and Joint Warfighting Assessments (JWA).</p> <p>FY 2017 Plans:</p>		-	0.885	2.461

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Provides for setup, utilities, furniture, equipment and maintenance (of all equipment and facilities) used by SoSE&I in support of Integrated Evaluation. Includes lease and support maintenance contracts for Government Service Administration (GSA) vehicles, IT equipment and support and facilities support closing-out NIE/AWA 16.1, planning, conducting and closing-out NIE17.2, planning and conducting NIE/AWA 18.1 and planning for NIE18.2 at FBTX/WSMR.			
<i>FY 2018 Plans:</i> Provides for setup, utilities, furniture, equipment and maintenance (of all equipment and facilities) used by SoSE&I (CPD) in support of Network Integration Evaluations (NIE) and Joint Warfighting Assessments (JWA). It includes lease and support maintenance contracts for Government Service Administration (GSA) vehicles, IT equipment/support and facilities to support NIEs and JWAs.			
Accomplishments/Planned Programs Subtotals	10.768	65.844	58.395

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
• DY4: <i>Network Integration Support</i>	13.700	-	-	-	-	-	-	-	-	0.000	13.700
• DY5: <i>Production/Fielding Coordination for Capability Sets</i>	3.486	3.960	4.261	-	4.261	4.349	4.434	4.524	4.502	Continuing	Continuing
• DY6: <i>Brigade and Platform Integration Support</i>	44.164	-	-	-	-	-	-	-	-	0.000	44.164
• DY7: <i>Army Systems Engineering, Architecture and Analysis</i>	15.802	14.166	15.508	-	15.508	15.998	25.121	25.499	26.214	Continuing	Continuing
• DZ6: <i>Army Integration & Coordination Management</i>	8.366	5.746	6.775	-	6.775	6.922	7.065	7.217	7.367	Continuing	Continuing
• FG7: <i>Emerging Technology Initiatives</i>	-	56.939	60.421	-	60.421	39.991	39.985	35.995	41.020	Continuing	Continuing

Remarks

D. Acquisition Strategy
This project includes competitive contracts for test support services. Additional competitive contracts are awarded by Defense Information Systems Agency (DISA) for satellite support.

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 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</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			
Core Government Labor	Allot	SoSE&I : Various	0.000	-		-		4.056		-		4.056	Continuing	Continuing	0.000
Matrix Government Labor	MIPR	SoSE&I : Various	0.000	-		-		3.331		-		3.331	Continuing	Continuing	0.000
MITRE Labor	FFRDC	MITRE : Various	0.000	-		-		1.820		-		1.820	Continuing	Continuing	0.000
Contractor SETA Labor	C/CPFF	TBD : Various	0.000	-		-		5.620		-		5.620	Continuing	Continuing	0.000
Temporary Duty (TDY)	Allot	SoSE&I : Various	0.000	-		-		1.000		-		1.000	Continuing	Continuing	0.000
Subtotal			0.000	-		-		15.827		-		15.827	-	-	0.000

Remarks

- Program Activities performed at Aberdeen Proving Grounds (MD), FT Bliss (TX), White Sands Missile Range (NM) and the selected NIE/JWA unit's home station.
- Other NIE/JWA subject matter expertise support provided using existing Army contracts managed by PEO C3T, ATEC, and CERDEC.

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			
Integrated Evaluations	Various	Various : TBD	0.000	-		62.959	Nov 2016	-		-		-	0.000	62.959	0.000
Subtotal			0.000	-		62.959		-		-		-	0.000	62.959	0.000

Remarks

- Program Activities performed, Aberdeen Proving Grounds (MD), FT Bliss (TX), White Sands Missile Range (NM) and the selected NIE/JWA unit's home station.
- Vehicle Integration performed under contract W56HZV-15-D-ER03 by BRTRC and other NIE/JWA support provided using existing Army contracts managed by PEO C3T, ATEC, and CERDEC.
- Includes support services from DISA (for satellite time) and other governments agencies

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			
Other Support Costs	C/TBD	TBD : Various	7.385	4.200	Nov 2015	-		-		-		-	0.000	11.585	0.000
Vehicle Integration	C/CPFF	BRTRC : Various	0.000	-		-		12.000		-		12.000	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 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</i>
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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			
Network Integration and Baseline Systems	MIPR	PEO C3T : Various	0.000	-		-		10.000		-		10.000	Continuing	Continuing	Continuing
Infrastructure and other support	TBD	TBD : Various	0.000	-		2.885	Nov 2016	5.000		-		5.000	Continuing	Continuing	Continuing
Subtotal			7.385	4.200		2.885		27.000		-		27.000	-	-	-

Remarks

- Program Activities performed at Aberdeen Proving Grounds (MD), FT Bliss (TX), White Sands Missile Range (NM) and the selected NIE/JWA unit's home station.
- Vehicle Integration performed under contract W56HZV-15-D-ER03 by BRTRC.
- Network Integration and Baseline Systems subject matter expertise support provided using existing Army contracts managed by PEO C3T and its subordinate Program Managers (PMs).

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			
ATEC Test and Evaluation Support	MIPR	ATEC : Various	11.549	6.568	Nov 2015	-		3.500		-		3.500	Continuing	Continuing	Continuing
Lab Based Risk Reduction (LBRR)	MIPR	CERDEC : APG, MD	0.000	-		-		5.300		-		5.300	Continuing	Continuing	Continuing
Satellite Region Hub Node (RHN) Technical Support	MIPR	Cyber Battle Lab : Ft. Gordon, GA	0.000	-		-		2.339		-		2.339	Continuing	Continuing	Continuing
Satellite Transponder Bandwidth	MIPR	DISA : Various	0.000	-		-		2.500		-		2.500	Continuing	Continuing	Continuing
Cyber Vulnerability/Risk Assessments	MIPR	Army Research Laboratory : Various	0.000	-		-		0.700		-		0.700	Continuing	Continuing	Continuing
Systems Under Evaluation (SUEs)	C/Various	TBD : Various	0.000	-		-		1.229		-		1.229	Continuing	Continuing	Continuing
Subtotal			11.549	6.568		-		15.568		-		15.568	-	-	-

Remarks

- Program Test support through ATEC, Lab Based Risk Reduction through CERDEC, and Cyber Vulnerability/Risk Assessments through Army Research Laboratory (ARL).
- Satellite RHN Technical Support provided by the Cyber Battle Lab at Fort Gordon, GA and Satellite Transponder Bandwidth contracted through DISA.

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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army										Date: May 2017							
Appropriation/Budget Activity 2040 / 5						R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>					Project (Number/Name) DY3 / <i>NIE Test & Evaluation</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	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract		
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost					
- Program Activities performed at Aberdeen Proving Grounds (MD), FT Bliss (TX), White Sands Missile Range (NM) and the selected NIE/JWA unit's home station.																	
			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			18.934	10.768		65.844		58.395		-		58.395	-	-	-		

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</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
NIE/AWA 16.1 Planning - Execution																												
NIE/AWA 16.1 Lab Integration/Testing																												
NIE/AWA 16.1 CommEx																												
NIE/AWA 16.1 Pilot																												
NIE/AWA 16.1 Event																												
NIE/AWA 16.1 Event Analysis & Summary																												
NIE 16.2 Planning - Execution																												
(1) NIE 16.2 DP 2																												
NIE 16.2 Lab Integration/Testing																												
NIE 16.2 Candidate Solution Integration																												
NIE 16.2 ValEx																												
NIE 16.2 CommEx																												
NIE 16.2 Pilot																												

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</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
NIE 16.2 Event			■																									
NIE 16.2 Event Analysis & Summary				■																								
AWA 17.1 Planning - Execution																												
(1) AWA 17.1 DP 2	▲																											
AWA 17.1 Lab Integration/Testing				■																								
AWA 17.1 Candidate Solution Integration				■																								
AWA 17.1 ValEx				■																								
AWA 17.1 Garrison CommEx				■																								
AWA 17.1 Field CommEx				■																								
AWA 17.1 Event				■																								
AWA 17.1 Event Analysis & Summary								■																				
NIE 17.2 Planning - Execution																												
(2) NIE 17.2 DP 1			▲																									

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</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
NIE 17.2 Lab Integration/Testing																												
NIE 17.2 Candidate Solution Integration																												
NIE 17.2 ValEx																												
NIE 17.2 Garrison CommEx																												
NIE 17.2 Pilot																												
NIE 17.2 Event																												
NIE 17.2 Event Analysis & Summary																												
JWA 18.1 Planning - Execution																												
(1) JWA 18.1 DP 1																												
(2) JWA 18.1 DP 2																												
JWA 18.1 Lab Integration/Testing																												
JWA 18.1 Candidate Solution Integration																												
JWA 18.1 ValEx																												

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</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								
JWA 18.1 Garrison CommEx																																	■			
JWA 18.1 Field CommEx																																	■			
JWA 18.1 Event																																	■			
JWA 18.1 Event Analysis & Summary																																	■			
NIE 18.2 Planning - Execution																													▲							
(1) NIE 18.2 DP 2																													▲							
NIE 18.2 Lab Integration/Testing																													■							
NIE 18.2 Candidate Solution Integration																													■							
NIE 18.2 ValEx																													■							
NIE 18.2 Garrison CommEx																													■							
NIE 18.2 Pilot																													■							
NIE 18.2 Event																													■							
NIE 18.2 Event Analysis & Summary																													■							

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</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
JWA 19.1 Planning - Execution	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">1</div> <div style="text-align: center;">2</div> </div>																											
(1) JWA 19.1 DP 1																												
(2) JWA 19.1 DP 2																												
JWA 19.1 Lab Integration/Testing																												
JWA 19.1 Candidate Solution Integration																												
JWA 19.1 ValEx																												
JWA 19.1 Garrison CommEx																												
JWA 19.1 Field CommEx																												
JWA 19.1 Event																												
JWA 19.1 Event Analysis & Summary																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
NIE/AWA 16.1 Planning - Execution	3	2014	1	2016
NIE/AWA 16.1 Lab Integration/Testing	3	2015	1	2016
NIE/AWA 16.1 CommEx	4	2015	1	2016
NIE/AWA 16.1 Pilot	1	2016	1	2016
NIE/AWA 16.1 Event	1	2016	1	2016
NIE/AWA 16.1 Event Analysis & Summary	1	2016	1	2016
NIE 16.2 Planning - Execution	3	2015	4	2016
NIE 16.2 DP 2	1	2016	1	2016
NIE 16.2 Lab Integration/Testing	1	2016	3	2016
NIE 16.2 Candidate Solution Integration	2	2016	2	2016
NIE 16.2 ValEx	2	2016	3	2016
NIE 16.2 CommEx	3	2016	3	2016
NIE 16.2 Pilot	3	2016	3	2016
NIE 16.2 Event	3	2016	3	2016
NIE 16.2 Event Analysis & Summary	3	2016	4	2016
AWA 17.1 Planning - Execution	3	2015	2	2017
AWA 17.1 DP 2	1	2016	1	2016
AWA 17.1 Lab Integration/Testing	3	2016	1	2017
AWA 17.1 Candidate Solution Integration	4	2016	4	2016
AWA 17.1 ValEx	4	2016	4	2016
AWA 17.1 Garrison CommEx	4	2016	1	2017
AWA 17.1 Field CommEx	1	2017	1	2017

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
AWA 17.1 Event	1	2017	1	2017
AWA 17.1 Event Analysis & Summary	1	2017	2	2017
NIE 17.2 Planning - Execution	3	2016	1	2018
NIE 17.2 DP 1	3	2016	3	2016
NIE 17.2 Lab Integration/Testing	2	2017	4	2017
NIE 17.2 Candidate Solution Integration	2	2017	3	2017
NIE 17.2 ValEx	3	2017	3	2017
NIE 17.2 Garrison CommEx	3	2017	3	2017
NIE 17.2 Pilot	4	2017	4	2017
NIE 17.2 Event	4	2017	4	2017
NIE 17.2 Event Analysis & Summary	4	2017	1	2018
JWA 18.1 Planning - Execution	3	2016	3	2018
JWA 18.1 DP 1	3	2016	3	2016
JWA 18.1 DP 2	4	2016	4	2016
JWA 18.1 Lab Integration/Testing	1	2018	3	2018
JWA 18.1 Candidate Solution Integration	2	2018	2	2018
JWA 18.1 ValEx	2	2018	3	2018
JWA 18.1 Garrison CommEx	3	2018	3	2018
JWA 18.1 Field CommEx	3	2018	3	2018
JWA 18.1 Event	3	2018	3	2018
JWA 18.1 Event Analysis & Summary	3	2018	3	2018
NIE 18.2 Planning - Execution	2	2017	1	2019
NIE 18.2 DP 2	2	2017	2	2017
NIE 18.2 Lab Integration/Testing	3	2018	4	2018
NIE 18.2 Candidate Solution Integration	3	2018	4	2018

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY3 / <i>NIE Test & Evaluation</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
NIE 18.2 ValEx	4	2018	4	2018
NIE 18.2 Garrison CommEx	4	2018	4	2018
NIE 18.2 Pilot	4	2018	4	2018
NIE 18.2 Event	4	2018	4	2018
NIE 18.2 Event Analysis & Summary	4	2018	1	2019
JWA 19.1 Planning - Execution	3	2016	4	2019
JWA 19.1 DP 1	3	2016	3	2016
JWA 19.1 DP 2	1	2017	1	2017
JWA 19.1 Lab Integration/Testing	1	2019	3	2019
JWA 19.1 Candidate Solution Integration	2	2019	2	2019
JWA 19.1 ValEx	2	2019	3	2019
JWA 19.1 Garrison CommEx	3	2019	3	2019
JWA 19.1 Field CommEx	3	2019	3	2019
JWA 19.1 Event	3	2019	3	2019
JWA 19.1 Event Analysis & Summary	3	2019	4	2019

Note

-With the loss of a dedicated unit (2/1 Armored Division), NIE/AWA event planning and a unit requirements determination has to be made earlier than in previous FYs to allow Forces Command (FORSCOM) time to select the unit participating in the test events.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>				Project (Number/Name) DY4 / <i>Network Integration 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
DY4: <i>Network Integration Support</i>	-	13.700	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	13.700
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2017, the mission requirements and the funding have been moved to DY3; NIE Test & Evaluation to increase transparency.

A. Mission Description and Budget Item Justification

This project supports Phases I through IV of the Army's Agile process. Phase I solicits potential solutions from existing Army programs, tech base programs, and industry to deliver capabilities that achieve the Army's Network 2020 Endstates and Objectives and Forces 2025 beyond. It establishes initial objectives, solidifies the architecture baseline and will establish a viable candidate list for Network Integration Evaluation (NIE). During Phase II, the project supports the compilations of potential solutions that could meet the Army's Mission Command gaps and the US Army Training and Doctrine Command (TRADOC) identified gaps which supports the development of integration and testing concepts for the NIE. Phase III includes the coordinated efforts between System of Systems Integration (SOSE&I), Brigade Modernization Command (BMC) at Ft Bliss and the Army Test and Evaluation Command (ATEC) to finalize the brigade architecture "horseblanket", integration and test planning, training requirements and combat mission evaluations. Phase III also includes the initial integration phase where Systems Under Test (SUT) and government/industry System Under Evaluation (SUE) hardware and software are integrated and initially evaluated for follow-on consideration at Aberdeen Proving Ground's (APG) Communications Electronics Research, Development and Engineering Center (CERDEC) labs through the Lab Based Risk Reduction (LBRR) process. This project provides for Network Integration of all SUTs and SUEs (industry and/or government) Hardware/Software into existing CERDEC System Integration Laboratories at APG to risk reduce evaluation architectures, network configurations and identify integration issues prior to NIE. This effort continues into Phase IV as the network matures and becomes functional in the Lab. The results of this detailed lab based testing/evaluations will determine which SUTs and industry/government SUEs will continue in the NIE (Phases IV/V of the Army's Agile Network Integration process) and establishes the initial Network configuration that will be used in NIE. LBRR also reduces risk to NIE execution by testing the Network in the lab, resolving issues found in the Network lab test and optimizing the Networks performance. This is done in a lab environment that facilitates very efficient, cost effective determination of problems, and their subsequent corrections.

Additionally this project will integrate the Network at the CERDEC labs facilitate participation by small businesses and interfaces and integrate with Government Programs of Record with unique military secure interfaces and protocols. Purchase of any additional hardware and support above and beyond the proposed or available support if required for Lab Based Risk Reduction is also funded within this project. For Government SUEs, this project funds integration support at the CERDEC Labs. If the NIE program requires additional prototypes above and beyond the Program of Record for the Lab based Risk Reduction, it will also purchase this equipment. This project also funds keeping the Network baseline up to date so that integration is always into the current baseline network.

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

	FY 2016	FY 2017	FY 2018
Title: NIE Network Integration and Lab Based Risk Reduction	8.081	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Description: These funds provide for the following: Network Integration of all industry and government SUEs, SUTs, and baseline Hardware/Software into existing CERDEC System Integration Laboratories at Aberdeen Proving Grounds (APG) to simulate the Brigade Network for NIE and determine if SUE's capabilities successfully resolve known gaps.</p> <p>FY 2016 Accomplishments: The funding provided for the Lab Based Network Analysis and evaluations for NIE 16.2 and AWA 17.1 network assessing the technical feasibility of 76 capabilities for participation in the LBRR and event execution.</p> <p>In the CERDEC labs, engineers created a representative NIE/AWA network architecture incorporating radios, satellite-based systems, handheld devices, mission command applications, routers, software, cables and other network components. Through a combination of actual and emulated hardware and software they modeled the end-to-end network, allowing industry and government organizations the ability to "plug" their systems into the architecture for early assessment and integration risk mitigation.</p> <p>The lab activity validated the NIE/AWA network architecture products and network configurations using a Brigade-scale network consisting of a mixture of live and virtualized hardware and software. Products included plans/execution/reports of the following: system level specification verification, instrumentation verification, pre-event analysis, Network Integration Requirements Levels, Measures of Performance, communication load plan, automated performance assessment of technical, configuration control, transport and software basis of issue, instrumentation plan, field troubleshooting and reach back support during event execution, routing design for NIE/AWA, and technical input to the reports to industry of system performance and issues.</p>			
<p>Title: NIE and LBRR Requirements Definition Support</p> <p>Description: These funds provide for all government and contract personnel and equipment which work with TRADOC and Army G-3/5/7 to finalize the architecture, requirements, and horseblanket for each NIE/AWA.</p> <p>FY 2016 Accomplishments: Planned and coordinated with multiple stakeholders (TRADOC, G-3/5/7, and ASA(ALT) PEOs) to finalize the operational gaps and develop sources sought, or government technical call to select industry and government SUEs to participate in NIE 16.2 and AWA 17.1. This also included the development, evaluation and down-select criteria and evaluation of sources sought, government technical calls proposals. This effort included management of the down-selections for each event, development and delivery of the final implementation horseblanket architecture and design for the NIE and AWA. It also included all program information, security, business, schedule, personnel management, network integration, evaluation, and reporting efforts required to support phases I-III</p>	3.852	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
of the Agile process. This effort also included the management and implementation of phase VI system recommendations across the ASA(ALT) PEO communities.			
Title: NIE SUE Hardware/Software for Lab & FSR Support for Network Integration Description: The effort includes procurement of Hardware and Software required by the Lab to fully simulate the Brigade Network it includes the FSR Support from Contractors to fully integrate their systems into the Network. FY 2016 Accomplishments: Provided funding to support Network integration and evaluation at the CERDEC Lab at APG. This supported network integration of technologies which were being selected for participation into the Army's NIE 16.2 & AWA 17.1. These funds covered participation in the lab integration event including contractor's costs for travel, shipment of equipment, Contractor Field Service Representatives (CFSRs) required to support Network integration activities, and the purchase of additional prototypes if required for the CERDEC Lab to effectively complete detailed evaluations of the complete brigade network architecture.	1.195	-	-
Title: Facilities and IT Support Description: Provides funding for infrastructure/facilities and IT support. FY 2016 Accomplishments: Provided funding for infrastructure/facilities. In addition it included the cost for IT support from network connectivity for purchasing/leasing hardware, software, computers, communications equipment and services for the government staff.	0.572	-	-
Accomplishments/Planned Programs Subtotals	13.700	-	-

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
• DY3: <i>NIE Test & Evaluation</i>	10.768	65.844	58.395	-	58.395	61.482	49.699	45.735	50.051	Continuing	Continuing
• DY5: <i>Production/Fielding Coordination for Capability Sets</i>	3.486	3.960	4.261	-	4.261	4.349	4.434	4.524	4.502	Continuing	Continuing
• DY6: <i>Brigade and Platform Integration Support</i>	44.164	-	-	-	-	-	-	-	-	0.000	44.164
• DY7: <i>Army Systems Engineering, Architecture and Analysis</i>	15.802	14.166	15.508	-	15.508	15.998	25.121	25.499	26.214	Continuing	Continuing
• DZ6: <i>Army Integration Management & Coordination</i>	8.366	5.746	6.775	-	6.775	6.922	7.065	7.217	7.367	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
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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>
• FG7: <i>Emerging Technology Initiatives</i>	-	56.939	60.421	-	60.421	39.991	39.985	35.995	41.020	Continuing	Continuing

Remarks

D. Acquisition Strategy

This project does not have any requirement for direct procurement of hardware or software.

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 / 5					R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>				Project (Number/Name) DY5 / <i>Production/Field Coordination for Capability Sets</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
DY5: <i>Production/Field Coordination for Capability Sets</i>	-	3.486	3.960	4.261	-	4.261	4.349	4.434	4.524	4.502	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides for the development of a synchronized Brigade/Division level plan for the Production equipment delivery and Fielding (hand-off logistics and new equipment training) of Capability Set (CS) components (both hardware/software in A and/or B Kits) upon completion of Network Integration Evaluation (NIE), Army Interoperability Certification (AIC) and Army CS fielding decision.

This project includes the following efforts: Oversight and direct coordination between participating Program Executive Offices (PEOs), Program Managers (PMs), Research, Development and Engineering Commands (RDECOMs) and the Army's Brigade Combat Teams (BCT) throughout the CS Vehicle Integration and Synchronized Fielding process to ensure that a CS package is received, integrated, trained, and handed-off to the unit in a synchronized and efficient manner. Identification and assessment of available capabilities for inclusion into a CS. Alignment of the CS requirements with the appropriate Programs of Record (PoR) and the recipient unit to define the unit's Network Basis of Issue (NBOI)/ Architecture by type of BCT. Coordination with PEOs, PMs, Army G-staff to ensure CS products are Materiel Released/Type Classified, fully resourced and synchronized by a single Integrated Master Schedule for design integration, testing, production, kitting, platform integration, training and fielding. Direct support during each of the unit's "New Equipment Training" and "New Equipment Fielding", along with the preparation for the BCT's rotation through one of the Army's Combat Training Centers, (Joint Readiness Training Center (JRTC) or National Training Center (NTC)). Ensuring that all training assets are reset and moved to the follow-on BCT. Manage all After Action activities.

This project does not fund the actual production, integration, nor fielding costs associated with the CS.

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

	FY 2016	FY 2017	FY 2018
Title: Production/Fielding Coordination for Capability Sets (CS)	3.252	3.960	4.261
Description: These funds provide for the following: Development, coordination and execution management of the CS Fielding Plan needed to deliver and train a set of capabilities in an integrated manner to minimize impact to the unit's operational requirements. This effort funds planning and coordination of resources, integrated schedule, training, and fielding across CS Programs of Record (PoR). Provides integrated system identification documents to the gaining unit for ease of property transfer in Property Book Unit Supply Enhanced (PBUSE). Provides integrated coordination of facilities across all fielding activities to efficiently synchronize facility requirements linked to the IMS for all PMs with garrison support activities. Coordinate standard transfer processes for all PMs to reduce the complexity and administrative burden on the gaining units. Synchronize fielding planning to include synchronized production deliveries, NET, fielding and support (with sponsoring PMs) to execute within the specified System Readiness Model (SRM) windows. Synchronizes, integrates, and coordinates the execution of LTI on 700+ Brigade platforms. Coordinates the set up and execution of the two each production lines for each LTI installation			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>including coordination of the unit for platforms to maintain efficient throughput of systems. Plan synchronization, integration, and coordination of CS Fielding. Plan a synchronized New Equipment Training /New Equipment Fielding (NET/NEF) Integrated Master Schedule (IMS) for CS gaining units. Provides strategic guidance and priorities, establish organizational goals, develop plan to achieve strategic Army BCT network modernization goals and management of Fielding Integration and Engineering Integration Divisions, CS Scheduler, and Trail Boss team. Coordinate and synchronize funding between PEOs that affect engineering architecture data products, training packages, and logistics packages to meet System of Systems integration requirements. Provide strategic guidance for fielding integration support teams, in coordination with over 35 PMs and various Army stakeholders, to enable a successful network through CS Fielding as well as modernization of the Army BCT formation network systems into a fully-integrated network. Conduct synchronization and execution of all new equipment training and fielding integration activities to include LTI integration, CS Synchronization meetings, New Materiel Introductory Briefings and Rehearsal of Concepts drills. Conduct coordination, development, integration, synchronization and execution of the New Equipment Training, New Equipment Fielding (NET/NEF) and LTI comprehensive schedule that puts the unit on a glide path to successfully train and operate a more robust Network Capability.</p> <p>Note: It does not fund the production, physical integration, or fielding of the CS.</p> <p>FY 2016 Accomplishments: Synchronized, integrated and coordinated Capability Set Fielding for CS-16 and initiated detailed planning for CS-17 and high level planning for CS18/19.</p> <ul style="list-style-type: none"> • Synchronized integration of BCT Reference architectures consisting of multiple network systems, on multiple configurations of STRYKER, MRAPS, HMMWV and Heavy Armor vehicle platforms, at multiple locations; • Integrated designs by platform, by role, by echelon, and by BCT for CS16 including LTI. • Finalized CS-16 requirements, developed and coordinated the Integrated Master Schedule (IMS) for CS-16; • Coordinated A-Kit design, development and production and B-Kit's Integration Kit (IK) design, between system and platforms PEOs and PMs for CS16. • Coordinated and delivered prototype and production builds for CS16 • Configuration Management (CM) of Platform Architectural implementations, designs, A-Kits, B-Kits, and the IMS for CS16. • Coordinated fielding integration of Program of Record assets in accordance with the defined BCT Reference architecture consisting of multiple systems, on multiple configurations of STRYKER, MRAPS, and HMMWV platforms, at several different locations, integrated into multiple gaining Army Units. • Coordinated a synchronized New Equipment Training /New Equipment Fielding (NET/NEF) Integrated Master Schedule (IMS) for fielding of CS-16 to all gaining units. This included 1 Division HQ, 5 IBCTs and 1 SBCT. • Completed NET by platforms, by role, by echelon, and by BCT. 			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> • Began CS-17 NET/NEF requirements definition finalization and development of the NET/NEF integrated master schedule. This includes scheduling Program of Record unique NET, System of Systems NET (Capability Set holistic classes), and property accountability handoffs as an integrated process to enhance efficiency of the brigade modernization events. • Provided integrated system identification documents to the gaining unit for ease of property transfer in PBUSE/GCSS-Army. • Provided integrated management of facilities across all fielding activities to efficiently manage facilities requirements linked to the Integrated Master Schedule for all PMs with garrison support activities. • Coordinated standard transfer processes for all PMs to reduce the complexity and administrative burden on the gaining units. Synchronized fielding planning to include synchronized production deliveries, NET, fielding and support (with sponsoring PMs) to execute within the specified Sustainment Readiness Model windows. • Synchronized, integrated and coordinated execution of Lower Tactical Internet (LTI) on 700+ platforms for each of two (2) IBCTs. • Coordinated the set up and execution of the 3ea production lines for each LTI installation including coordination of the unit for platforms to maintain efficient through put of systems. • Coordinated funding requirements and delivery/production schedules to ensure production schedules are met to field selected systems. • Completed funding coordination with DA and prioritized requirements at Weapons Systems Reviews (WSR). • Aligned funding requirements for PMs to make updates to their PORs as a result of integrating concepts that affect engineering architecture data products, training packages, logistics packages, etc. <p>FY 2017 Plans: These funds provide for the following:</p> <ul style="list-style-type: none"> - Production/Fielding Coordination for Capability Sets (P/FC-CS): Development, coordination and execution of the CS Fielding plan to take the results of previous NIEs and produce, integrate, and field these Brigade improvements to the BCTs and synchronize, integrate and coordinate Capability Set Fielding for CS16 closeout, CS-17 execution, detailed planning for CS-18 and high level planning for CS19/20. This effort does not fund the production, or integration, or fielding of the capability set, but it does fund the coordination of this activity for the Army through the supporting Program Managers (PMs), Program Executive Officers (PEOs), and Research, Development, Engineering Command (RDECOMs). - P/FC-CS: CS16 Products and Services: Final close out of Materiel Fielding documentation and After Action Reports (AARs) for (1) Total Army Analysis (TAA) Infantry Brigade Combat Team (IBCT) with Lower Tactical Internet (LTI), (3) TAA IBCTs and (1) Division (DIV) Headquarters (HQ). - P/FC-CS: CS17 Products and Services: 			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Synchronize integration of Brigade Combat Team (BCT) consisting of multiple network systems, on multiple configurations of Stryker, Mine Resistant Ambush Protected (MRAPs), High Mobility, Multipurpose Wheeled Vehicle (HMMWV) and Heavy Armor vehicle platforms, at multiple locations; complete synchronization, integration and coordination execution of Capability Set fielding for the following CS17 Units ((45) Total): (2) Total Army Analysis (TAA) 2020 IBCTs with Lower Tactical Internets (LTIs), (1) TAA IBCT, (1) Division Headquarters (HQ) and (1) TAA Stryker Brigade Combat Team (SBCT). Coordinate the integrated designs by platform, by role, by echelon, and by BCT for CS17 including LTI; finalize CS-17 fielding requirements and execute the Integrated Master Schedule (IMS) for CS-17; coordinate A-Kit design, development and production and B-Kit's Integration Kit (IK) design, between system and platforms Program Executive Offices (PEOs) and Program Managers (PMs) for CS17; coordinate and deliver prototype and production builds for CS17; support Configuration Management (CM) of platform configuration implementations, designs, A-Kits, B-Kits, and the IMS for CS17; coordinate fielding integration of Program of Record (POR) assets in accordance with the defined BCT Reference architecture consisting of multiple systems, on multiple configurations of Stryker, MRAPs, HMMWV and Heavy Armor vehicle platforms, at several different locations; integrated into multiple gaining Army Units; and coordinate and publish a synchronized New Equipment Training /New Equipment Fielding (NET/NEF) Integrated Master Schedule (IMS) for fielding of CS-17 to all gaining units.</p> <p>- P/FC-CS: Provides integrated system identification documents to the gaining unit for ease of property transfer in Property Book Unit Supply Enhanced (PBUSE): provides integrated coordination of facilities across all fielding activities to efficiently synchronize facility requirements linked to the IMS for all PMs with garrison support activities; coordinate standard transfer processes for all PMs to reduce the complexity and administrative burden on the gaining units; synchronize fielding planning to include synchronized production deliveries, NET, fielding and support (with sponsoring PMs) to execute within the specified Army Force Generation (ARFORGEN) windows. Synchronizes, integrates and coordinates the execution of LTI on 700+ platforms for each of two (2) IBCTs in FY17: coordinates the set up and execution of the 2 each production lines for each LTI installation including coordination of the unit for platforms to maintain efficient throughput of systems; plan synchronization, integration and coordination of Capability Set fielding for the following CS18 Units ((7) Total): (1) IBCT with JBC-P (Army National Guard (ARNG)), (1) ARNG Division HQ, (2) IBCT Division HQ and (3) TAA IBCTs; coordinate and publish a synchronized New Equipment Training /New Equipment Fielding (NET/NEF) Materiel Fielding Plan (MFP) for fielding of CS-18 to all gaining units; plan a synchronized New Equipment Training /New Equipment Fielding (NET/NEF) Integrated Master Schedule (IMS) for fielding of CS-18 to all gaining units.</p> <p>- P/FC-CS: Provides strategic guidance and priorities, establish organizational goals, develop plan to achieve strategic Army BCT network modernization goals and management of Fielding Integration and Engineering Integration Divisions, CS Scheduler, and Trail Boss team; coordinate and synchronize funding between PEOs that affect engineering architecture data products, training packages, and logistics packages to meet System of Systems integration requirements; provide strategic guidance for fielding integration support teams, in coordination with over 35 PMs and various Army stakeholders, to enable a successful network</p>			

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

	FY 2016	FY 2017	FY 2018
<p>through Capability Set (CS) fielding as well as modernization of the Army BCT formation network systems into a fully-integrated network; synchronization and execution of all new equipment training and fielding integration activities to include Lower Tactical Internet integration, CS Synchronization meetings, New Materiel Introductory Briefings and Rehearsal of Concepts drills; conduct coordination, development, integration, synchronization and execution of the New Equipment Training, New Equipment Fielding (NET/NEF) and LTI comprehensive schedule that puts the unit on a glide path to successfully train and operate a more robust Network Capability; overall Conduct coordination, synchronization and execution of the New Equipment Training comprehensive schedule; and start planning for fielding to (1) Army National Guard IBCT and (1) Army National Guard Division in FY18-19.</p> <p>- P/FC-CS: CS18 Products and Services: Conduct synchronization, and coordination of Capability Set fielding for the following CS18 Units ((7) Total): (1) IBCT with LTI (Army National Guard (ARNG)), (1) ARNG Division HQ, (2) IBCT Division HQ and (3) TAA IBCTs; execute a synchronized New Equipment Training /New Equipment Fielding (NET/NEF) Integrated Master Schedule (IMS) for fielding of CS-18 to all gaining units; begin CS-18 NET/NEF requirements definition finalization and development of the NET/NEF integrated master schedule. This includes logically scheduling Program of Record unique NET, System of Systems NET (Capability Set holistic classes), and property accountability handoffs as an integrated process to enhance efficiency of the brigade modernization events.</p> <p>- Integration Engineering Planning and Execution of Capability Sets: (IEP&E-CS) These funds provide for the advance collaboration and coordination with platform and network system Program Managers (PMs) to ensure Capability Set (CS) fielding platform integration design decisions are based on CS Reference Architecture products for CS16-22 to be evaluated in Network Integration Evaluation (NIE) events: develop the Unit-specific architecture (e.g., Integrated Network Basis of Issue (IBOI), Unit Transport Design (TD), etc.) for CS fieldings. Develop, synchronize, integrate and coordinate CS architecture design and test for CS-16 closeout, CS-17, detailed planning for CS-18 and high level planning for CS19-21; engineering coordination with platform and equipment integrators to ensure component through platform level integrated design meets requirements established in the Unit IBOIP; ensure the integrated architecture design is verified and functional. Develop the unit integration design and configuration for CS-16 closeout, CS-17, detailed planning for CS-18 and high level planning for CS19-21. Update and transition architecture products to stakeholders by utilizing Unit specific IBOIPs based on property book/ maintenance analysis and physical inventory comparisons of Forces Command (FORSCOM) assets; assess, synchronize and status production and installation CS Engineering products and processes for platform integration and installation at integration facilities meet delivery schedules; and document and continuously improve engineering activities and process flows for efficiencies.</p> <p>- IEP&E-CS: CS17 Products and Services: Synchronize and monitor platform and network system Size, Weight and Power (SWaP) assessment of Unit specific Architectures in collaboration and coordination with platform and network system PMs; coordinate NRE funding requirements and delivery/</p>			

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

	FY 2016	FY 2017	FY 2018
<p>production schedules with the Synch Fielding – Fielding team to ensure production schedules are met to field selected systems; develop, update and finalize the unit specific IBOIP, perform site inventory and analysis, develop CS vehicle/equipment configurations, develop the CS Non-Recurring Engineering (NRE) integration configurations for design (based on NIE Original Equipment Manufacturer involvement). Provide integration status of equipment designs by platform, role, echelon and by BCT for the following CS17 Units ((5) Total): (2) Total Army Analysis (TAA) 2020 IBCTs with Lower Tactical Internets (LTIs), (1) TAA IBCT, (1) Division Headquarters (HQ) and (1) TAA SBCT. Develop, coordinate, document and assess the updated and final LTI integration activities on 700+ platforms and evaluate the integration flow of multiple production lines of numerous platform types; develop, update and finalize the Unit specific IBOIPs (one for each Unit touched) are vetted with vehicle and equipment PMs, TRADOC Capability Managers (TCMs), Program Executive Offices (PEOs), G3/5/7, FORSCOM, Unit personnel and other stakeholders; perform Property Book Unit Supply Enhanced (PBUSE) and Standard Army Maintenance System (SAMS) unit analyses to determine the serial and bumper numbers that are used to align vehicle roles by echelon (based on the Modified Table of Organization and Equipment (MTOE) and Objective Table of Organization and Equipment (OTOE)); perform Unit Inventories to confirm vehicle and legacy equipment configurations, confirm vehicle roles and identify/coordinate in lieu of vehicles for shortages; develop NRE designs for vehicle and equipment (legacy and CS) configurations that will be required for Safety Release/Confirmation (SR/SC) testing; coordinate with platform PMs the NRE configurations that are combined to develop a CS Golden vehicle design candidate list to minimize SR/SC costs; monitor and assess the development of the A-kit design and ensure technical documents will produce a repeatable and consistent integration process using installation manuals and technical data packages.</p> <p>- IEP&E-CS: Monitor and coordinate the production and delivery of all CS A and B kits at the integration facility to assess production risk (technical, schedule and cost); and assess the ability of supporting PMs to produce (or acquire) and integrate CS equipment onto vehicle platforms. Provide technical direction in the establishment of effective manufacturing/integration processes, procedures and facilities; ensure plans for production resources (manpower, material, tooling & test equipment, etc.) are in-place and capable of supporting mission requirements; conduct reviews and assessments at key program decision points to ascertain the level of manufacturing / production readiness to proceed forward in the integration cycle and to ensure Integrated Master Schedule (IMS) event dates are met; monitor and report the status of integration of CS equipment onto platforms (and completed integrated platforms) and assess schedule slippages.</p> <p>- IEP&E-CS: Develop engineering and integration process flows to implement lean six sigma concepts and techniques for process improvements; coordinate with the Synch Fielding (SF) – Fielding team for planning and execution of unit meetings, site inventories, A/B kit deliveries, chalk vehicle block schedules, assessment of Fully Mission Capable condition and integration of vehicle schedules (both component and complete vehicle installations); provide production design and integration strategic guidance, goals and priorities and develop plans to achieve goals; identify and resolve highly complex network problems that cross organizational boundaries and promulgate solutions; assess political, fiscal, and other factors affecting stakeholder needs;</p>			

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY5 / <i>Production/Field Coordination for Capability Sets</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>work with stakeholders at management levels to resolve problems such as conflicting requirements, funding and priorities; seek innovative solutions to efficiently accomplish multiple efforts within allocated resources; develop capability set engineering products to include processes, schedule, established technical baselines through Technical Exchange Meetings (TEMs) and synchronization across stakeholder organizations.</p> <p>Prepare, review, and approve major engineering communications for internal and external distribution; to include personnel and programmatic documents are properly prepared, approved, routed and archived; perform Risk Management by working with stakeholders to proactively identify technical risks and develop mitigation plans for project execution; assess impacts of risk to performance, cost and schedule; plan, coordinate, lead and conduct the CS Architecture TEMs; document TEM action items and track to closure during Capability Set Management Board (CSMB) action officer working group meetings; and plan, coordinate, lead and conduct weekly CSMB WG meetings to level set all stakeholders concerning current issues, discussion topics and schedule changes.</p> <p>- IEP&E-CS: CS18 Products and Services: Evaluate, synchronize and monitor platform and network system program acquisition schedules, integration costs, and system requirements across organizations for the development of production ready A&B-kit Interface Control Documents (ICDs) and Level II Technical Data Packages (TDPs) supporting CS18 Unit specific baseline evaluations in collaboration and coordination with platform and network system PMs; synchronize CS program schedules through coordination and communication with System of Systems Engineering and Integration (SoSE&I) Engineering and Integration (E&I) and other organizations within and outside of SoSE&I; coordinate with associated SoSE&I Directorates for the integration, forecasting, procurement, testing and delivery of platform integrated Network equipment for CS baseline evaluations (e.g. Business Team, Contracting, SoSE&I Integration Planning, PD Capability Package, SF-Engineering, SF-Fielding, SoSE&I E&I, etc); and vet IBOIPs with vehicle and equipment PMs, TCMs, PEOs, G3/5/7, Unit personnel and other stakeholders.</p> <p>- IEP&E-CS: CS19-22 Products and Services: Evaluate, synchronize and monitor platform and network system SWaP assessment of CS17 Unit specific Architectures in collaboration and coordination with platform and network system PMs; evaluate, synchronize and monitor platform and network system integration risks and mitigation plans for IBOIP identified in the Initial and CS19-22 Reference Architectures in collaboration and coordination with platform and network system PMs; evaluate, synchronize and monitor platform and network system program acquisition schedules, integration costs, and system requirements across organizations for the development of production ready A&B-kit ICDs and Level II TDPs supporting CS19-22 baseline evaluations in collaboration and coordination with platform and network system PMs; adjudicate and resolve operational, technical and programmatic issues for Initial and Reference Architecture Products in collaboration and coordination with SoSE&I-E&I, platform PMs, network system PMs and TCMs; synchronize CS program schedules through coordination and communication with SoSE&I-E&I and other organizations within and outside of SoSE&I; coordinate with associated SoSE&I Directorates for the management, integration, forecasting,</p>			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2016	FY 2017	FY 2018
<p>procurement, testing and delivery of platform integrated Network equipment for CS baseline evaluations (e.g. Business Team, Contracting, SoSE&I Integration Planning, PD Capability Package, Synch Fielding (SF)-Engineering, SF-Fielding, SoSE&I E&I, etc); support PMs and PEOs in resolution of tasks associated with Network integration; evaluate, synchronize and monitor PM implementation of Vehicular Integration for (C4ISR) Command, Control, Communication, Computers, Intelligence, Surveillance, Reconnaissance / (EW) Electronic Warfare (EW) Interoperability (VICTORY) standards in Initial and CS19-22 Reference Architecture products; and begin the planning for CS-19-22 Unit specific IBOIP requirements and develop and coordinate the IMS with all stakeholders.</p> <p>FY 2018 Plans: These funds provide for the following: - Production/Fielding Coordination for CS: Development, coordination, and execution management of the CS Fielding plan needed to produce, integrate, and field NIE tested Brigade improvements to the BCTs. Synchronize the integration and coordinate CS Fielding including CS17 closeout, CS18 execution, and detail plan for CS19 along with high level planning for CS20/21. This effort funds government and contractor personnel and travel to unit location and fielding sites for planning and coordination of resources, integrated schedule, training and fielding across CS Programs of Record (PoR). It does not fund the production, physical integration, or fielding of the CS.</p> <p>- Production/Fielding Coordination for CS17 Products and Services: Complete training and fielding of CS 17 units which begins in the 4th Quarter of FY17. This includes to IBCTs (one Active and one USARNG) and one Division HQ. Final close out of Materiel Fielding documentation and After Action Reports (AARs) for one Total Army Analysis (TAA) Infantry Brigade Combat Team (IBCT) with Lower Tactical Internet (LTI), three (3) TAA IBCTs and one (1) Division (DIV) Headquarters (HQ).</p> <p>- Production/Fielding Coordination for CS18 Products and Services: Synchronize the integration of the CS package into the Brigade Combat Team (BCT) consisting of multiple network systems, on various configurations of Mine Resistant Ambush Protected (MRAP) and High Mobility Multipurpose Wheeled Vehicle (HMMWV) platforms, at multiple locations. Complete synchronization, integration, and coordination of CS Fielding for the following CS18 Units (five (5) total): field upgrade to LTI to two (2) Total Army Analysis (TAA) 2020 IBCTs, one (1) TAA 2020 IBCT (OCONUS), one (1) TAA Army National Guard (ARNG) IBCT, and one (1) ARNG Division Headquarters (HQs). Coordinate the integrated designs by platform, role, echelon, and BCT for CS18 including LTI. Finalize CS18 fielding requirements. Develop and manage the Integrated Master Schedule (IMS) for CS18. Coordinate A-Kit design, development and production and B-Kit's Integration Kit (IK) design, between system and platforms Program Executive Offices (PEOs) and Program Managers (PMs) for CS18. Coordinate the delivery of prototype and production builds for CS18. Support Configuration Management (CM) of platform configuration implementations, designs, A-Kits, and B-Kits. Support fielding integration of Program of Record (PoR) assets in</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>accordance with the defined BCT Reference architecture. Coordinate planning and execution of unit meetings, site inventories, A/B kit deliveries, chalk vehicle block schedules, assessment of Fully Mission Capable condition and integration of vehicle schedules (both component and complete vehicle installations). Coordinate and publish a synchronized New Equipment Training / New Equipment Fielding (NET/NEF) Integrated Master Schedule (IMS) for CS18 gaining units.</p> <p>- Production/Fielding Coordination for CS19 Products and Services: Conduct synchronization and coordination of CS Fielding for the following CS19 Units (four (4) Total): one (1) ARNG IBCT, one (1) ARNG Division HQ, two (2) TAA IBCT with LTI (including one OCONUS). Execute a synchronized New Equipment Training /New Equipment Fielding (NET/NEF) Integrated Master Schedule (IMS) for fielding of CS19 to all gaining units. Begin CS19 NET/NEF requirements definition finalization and development of the NET/NEF integrated master schedule. This includes scheduling Program of Record unique NET, System of Systems NET (Capability Set holistic classes), and property accountability handoffs as an integrated process to enhance efficiency of the brigade modernization events.</p> <p>- Engineering and Integration Effort to develop and maintain CS and Sync Fielding specific Integrated Master Schedule (IMS): Develop and maintain an IMS for the Army's Capability Set – Synchronized Fielding (CSSF) efforts. Close out the IMS for FY17, maintain the IMS for FY18 and FY19 and develop initial IMSs for FYs 20, 21 and 22. Collect and analyze sub-schedule performance against the baseline IMS to identify schedule risks for the Army's CSSF efforts. Validate that established integration points are achievable and, if not, identify the schedule risk. Analyze schedule performance against schedule baseline, identify variances and their causes, and identify risks and/or impacts to critical path. Perform "what if" schedule analysis of alternative program courses of action to determine impact on schedule critical path. Update and post schedules on SharePoint for visibility and increased collaboration across ASA (ALT). Participate in After Action Reviews, Lessons Learned, Synchronized Fielding Technical Exchange Meetings (TEMs). Provide scheduling reports and briefings to meet the needs of the CSSF community. It also includes Capability Sync Fielding IMS and briefings and IMS analysis reports. Coordinate, develop, and publish a synchronized New Equipment Training/New Equipment Fielding (NET/NEF) Integrated Master Schedule (IMS) for fielding of CS to all gaining units.</p>				
<p>Title: Facilities and IT Support</p> <p>Description: Provides funding for infrastructure/facilities and IT support.</p> <p>FY 2016 Accomplishments: Provided funding for infrastructure/facilities. In addition it included the cost for IT support from Network connectivity for purchasing/leasing hardware, software, computers, communications equipment and services for the government staff.</p>		0.234	-	-
Accomplishments/Planned Programs Subtotals		3.486	3.960	4.261

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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>
• DY3: <i>NIE Test & Evaluation</i>	10.768	65.844	58.395	-	58.395	61.482	49.699	45.735	50.051	Continuing	Continuing
• DY4: <i>Network Integration Support</i>	13.700	-	-	-	-	-	-	-	-	0.000	13.700
• DY6: <i>Brigade and Platform Integration Support</i>	44.164	-	-	-	-	-	-	-	-	0.000	44.164
• DY7: <i>Army Systems Engineering, Architecture and Analysis</i>	15.802	14.166	15.508	-	15.508	15.998	25.121	25.499	26.214	Continuing	Continuing
• DZ6: <i>Army Integration & Coordination Management</i>	8.366	5.746	6.775	-	6.775	6.922	7.065	7.217	7.367	Continuing	Continuing
• FG7: <i>Emerging Technology Initiatives</i>	-	56.939	60.421	-	60.421	39.991	39.985	35.995	41.020	Continuing	Continuing

Remarks

D. Acquisition Strategy

This project does not have any requirement for direct procurement of hardware or software.

E. Performance Metrics

N/A

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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
DY6: <i>Brigade and Platform Integration Support</i>	-	44.164	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	44.164
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2017, the mission requirements and the funding have been moved to DY3; NIE Test & Evaluation to increase transparency.

A. Mission Description and Budget Item Justification

This project supports Phase IV through Phase VI of the Army's Agile Acquisition Process and provides management and oversight for the coordinated Army effort to deliver and maintain Mission Command Baselines as interoperable System of Systems (SoS) capabilities through the synchronization, coordination and facilitation of system deliveries to interoperability certification events.

Based on developed baseline Brigade level architectures, SoS Engineering & Integration (SoSE&I) will assess against approved Department of the Army (DA) objectives and baseline Brigade Combat Team (BCT) architectures to plan for and integrate approved network hardware and software systems onto the Soldier and vehicle systems that comprise the integrated BCT network. Work encompasses design and engineering of hardware and cable interfaces (e.g., A-kits) that enable integration of network hardware onto vehicle platforms; development of network data products required to support evaluations of the network; verification of integrated BCT network performance in garrison and field environments; field support to network hardware and software systems that deploy to the field and participate in operational evaluations conducted throughout the BCT battlespace; and, following the operational evaluation, restoration of selected platforms to their baseline configurations. This project includes government and contractor efforts to validate that the Army is properly integrating and fielding trainable, maintainable, interoperable, and sustainable network systems and components that will provide increased warfighting capabilities for the Soldier. This project includes:

- Integration of lab-developed network solutions onto Soldier and vehicle systems;
- Design, and fabrication of mounting brackets, cables, and kits required to enable vehicle platforms to employ new network hardware and software systems;
- Installation and checkout of network hardware and software systems prior to turning the equipment over to the soldiers who will employ these systems during the Network Integration Evaluation (NIE);
- Funding for Field Service Representative (FSR) support for selected Systems Under Evaluation (SUEs) participating in Phase V of the Army's Agile Process;
- Validation of critical operational threads that demonstrate the stability and continuity of the tactical network exercised during the NIE;
- Planning, coordination, and execution of hardware and software system support during the operational phase of the NIE;
- De-modification of vehicles at completion of the event;
- Documentation of interface kits, performance trends, and Integrated Logistics Support (ILS) data to facilitate hand-off of high-payoff systems to designated Programs of Record (POR);
- Feedback to industry on the performance of their technologies, systems, and concept relative to known operational gaps;
- Maintenance of the infrastructure needed by SOSI to support NIE operations at Ft Bliss, TX and White Sands Missile Range, NM.

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• System of Systems (SoS) and specialty engineering support needed to build upon NIE-provided documentation and execute design integration, production plan and testing of Capability Sets (CSs) which consolidate high-payoff capabilities in integrated fielding packages; and, planning, management, and execution of CS design requirements to synchronize manufacturing development, production, and synchronized fielding to design a BCTs.

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

	FY 2016	FY 2017	FY 2018
<p>Title: Platform Integration Support</p> <p>Description: These funds provide for integration of network solutions onto Soldier and vehicle systems to enable an integrated network across the brigade battlespace.</p> <p>FY 2016 Accomplishments: For NIE 16.2, the organization designed, engineered, and integrated network components, subsystems, and systems onto 26 Golden Vehicles (GVs) and successfully completed safety assessments for 12 platforms in order to ensure their safe operation by soldiers. Following the GV effort, the organization successfully integrated and completed quality and validation checks on 220 Fleet vehicles used by the Brigade Combat Team during the NIE. After completion of the formal evaluation event, the Capability Package Directorate (CPD) demod-ed and returned 220 vehicles to the 2/1 AD BCT. For NIE 17.1, the organization designed, engineered, and integrated network components, subsystems, and systems onto 25 Golden Vehicles (GVs) and successfully completed safety assessments for 10 platforms in order to ensure their safe operation by soldiers. Following the GV effort, the organization successfully integrated and completed quality and validation checks on 102 Fleet vehicles used by the Brigade Combat Team during the AWA. After completion of the formal evaluation event, the Capability Package Directorate (CPD) demod-ed and returned 102 vehicles to the 2/1 AD BCT. This effort supported all activities associated with vehicle and platform integration: • Coordination and planning of hardware and software system deliveries to SoSE&I activities at Fort Bliss, TX; • Vehicle Integration (VI) planning and scheduling; • VI execution; • Network validation; • Field support; • Recovery from NIE field operations; • Develop and deliver CS-15 Implementation Architecture; • Documentation and handoff of critical information to support implementation of CS-15 efforts; • CS-16 planning and design analysis; • Synchronized fielding of CS-15 systems. Vehicle integration: Leveraging the work performed during FY2014 and using brigade architectures that represent an evolving network modernization strategy: • Develop Basis of Issue Plans (BOIPs) for each participating network hardware and software system; • Identify the type (or types) of vehicle platforms that will host each network system;</p>	16.430	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> • Identify and document vehicle size, weight, power, and electromagnetic constraints • Given vehicle size, weight, power, and electromagnetic constraints, develop engineering designs for the complete hardware kits (e.g., the brackets, mounting trays, cables, and other components that comprise an "A-Kit") needed to integrate each unique network hardware system onto each type of host platform that will participate in the NIE; • Fabricate unique hardware components needed to support vehicle integration efforts; • Integrate and verify the performance of each unique network system (e.g., B-kit) on its host vehicle - as specified by the BOIP; • Support installation and integration of instrumentation kits needed to collect data from designated network systems and verify that the instrumentation does not impact the performance of the network system; • Support the conduct of safety certification and release efforts for each unique vehicle configuration; • Perform SoS checkouts to ensure all SoSE&I-installed network hardware and software systems operate with each other, legacy systems, and other POR systems participating in the NIE; • Provide troubleshooting support for network validation exercises and selected network systems during the operational phase of the NIE/AWA; • De-installation of selected systems following each NIE/AWA; • Documentation and transfer of interface designs, training support requirements, performance trends, ILS requirements, and lessons learned to CS systems engineering teams; • Systems Engineering (SE) to mature the network interface designs developed during the NIE and enable expedited CS fielding; • Synchronized integration of a BCT Reference architecture consisting of multiple network systems, on multiple configurations of STRYKER, MRAPS, HMMWV and Heavy Armor vehicle platforms, at multiple locations; • Coordinate a synchronized Integrated Master Schedule (IMS) for fielding of CS-14 to all gaining units. • Integrate designs by platform, by role, by echelon, and by BCT. • Begin to finalize CS-16 requirements and develop and IMS for CS-16; • Coordinate A-Kit design, development and production and B-Kit's Integration Kit (IK) design, between system and platforms PEOs and PMs. • Coordinate and deliver prototype and production builds • Configuration Management (CM) of Platform Architectural implementations, designs, A-Kits, B-Kits, and the IMS. • Systems Engineering (SE) to include: design maturation, decomposition of reference architecture into platform specific implementations network architecture, prototype/production build, integrated testing, configuration of integrated baseline and an integrated schedule for component management • Synchronize acquisition strategy and planning to include: synchronized production deliveries, fielding and support (with sponsoring PMs) to maintain the ARFORGEN Cycle. 				
Title: Brigade Integration Support		11.981	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Description: These funds provide for the testing and verification of network components integrated with the BCT's vehicle and soldier systems that participate in NIE/AWA.</p> <p>FY 2016 Accomplishments: Brigade Integration: Once Platform/Vehicle Integration (VI) for NIE 16.2 and AWA 17.1 was complete; SOSE&I conducted a Network Validation Exercise (VALEX) to demonstrate network stability, connectivity, and performance in controlled conditions. VALEX consists of four phases: Load, Established, Integrate and Validate Threads.</p> <ul style="list-style-type: none"> • During the Load phase, network systems and SoS engineers installed network software, firmware, and Operating Systems (OSs), set Internal Protocol (IP) addresses and configured all network systems on all NIE/AWA-unique platforms (Note: Program of Record (POR) and Legacy engineers and FSRs perform the same tasks on any of their platforms that will participate in an NIE/AWA; PORs are NOT funded by SOSE&I to perform these functions). Once all software and data products were loaded, SOSE&I and supporting network engineers and FSRs performed test/fix/test processes at the network system and component level. • During the Establish phase, SOSE&I engineers and FSRs to worked with Legacy and POR network support personnel to verify network hardware and software performance at the platform level. This work troubleshoot any issues associated with network system configurations and ensured that each platform has the ability to perform its role within the tactical network. • In the Integrate phase, SOSE&I engineers and FSRs worked with Legacy and POR network personnel to verify network hardware and software performance at the SoS platform level – from the small unit (e.g., company, troop, or battery) up to the brigade. This work troubleshoot any issues associated with network SoS configurations and ensured that each networked tactical units interacted with each other as expected. Activities during the Integrate Phase included training of the Soldiers who will be using the new BCT network during the NIE/AWA. • The Validate phase executed operational threads designed to demonstrate the BCT network's ability to provide specific capabilities to the BCT commander. Throughout VALEX planning and execution, SOSE&I coordinated with the Army Test and Evaluation Command (ATEC) and Brigade Modernization Command (BMC) to ensure network instrumentation, training, and operational requirements were coordinated. 			
<p>Title: Network Integration Support</p> <p>Description: These funds provide for the field setup, validation, verification and correction of the network for the NIE/AWA.</p> <p>FY 2016 Accomplishments: Network Integration Data Product builds for all transport layer communication devices for NIE 16.2 and AWA 17.1. This effort included:</p> <ul style="list-style-type: none"> • Development of the NIE/AWA network's Lightweight Data Interchange Format (LDIF) file; • All NETOPS synchronization and coordination activities; 	5.782	-	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> Government Subject Matter Experts (SME) who assisted in the integration of specialized communication hardware in BCT Command and Control (C2) centers; Contractor FSRs and network Subject Matter Experts (SMEs) who helped SOSE&I ensure the network was operational during VALEX, BCT Communications Exercises (COMMEs), NIE Pilot Testing, and NIE execution. 				
<p>Title: NIE Infrastructure</p> <p>Description: Provides for Infrastructure (facilities) at Fort Bliss, TX and White Sands Missile Range (WSMR), NM.</p> <p>FY 2016 Accomplishments: Provided for setup, utilities, furniture, equipment and maintenance (of equipment and facilities) used by SoSE&I at Fort Bliss TX during the planning and execution of NIE 16.2 and 17.1. Includes lease and support maintenance contracts for Government Service Administration (GSA) vehicles that support the NIE/AWA mission at FBTX/WSMR.</p>		1.135	-	-
<p>Title: Network Integration Evaluation SUE support (NIE)</p> <p>Description: These funds provide for selected SUEs participation in NIE during Phase V of the Army's Agile process.</p> <p>FY 2016 Accomplishments: Provided funding to support integration and evaluation of technologies which were selected for participation in NIE 16.2 & 17.1 to achieve Army's Network 2020 and Force 2025 goals. These funds covered the NIE/AWA participant's costs for travel, shipment of equipment, Contractor Field Service Representatives (CFSRs) integration A-kit development, and the purchase of additional prototypes when needed to complete network architecture.</p>		1.017	-	-
<p>Title: Platform/BDE Integration Management Support</p> <p>Description: These funds provide for all SoSE&I government and contractor personnel providing direct management, systems engineering, and specialty engineering support to the Platform and Brigade Integration efforts at Ft Bliss in support of the NIE.</p> <p>FY 2016 Accomplishments: -Completed planning and coordination with multiple stakeholders for participation and resourcing of personnel, services, equipment and prototypes, and other deliverables needed for lab based risk reduction (LBRR), network and platform integration, training, field support and logistics, and event battle rhythm/schedules for AWA 16.1, NIE 16.2 and AWA 17.1. -Due to the return of the NIE evaluation unit (2/1 AD) to the force pool and based on HQDA, Forces Command (FORSCOM) and Training and Doctrine Command (TRADOC) guidance, accelerated planning for two FY17, two FY18 and one FY19 events. Staff worked simultaneously on six NIE / AWA (now called Joint Warfighting Assessments as of JWA 18.1) events, developing and arranging all solicitations, evaluation and decision presentations.</p>		7.819	-	-

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

	FY 2016	FY 2017	FY 2018
<p>- Planned and executed Technical Interchange Meetings to assess technical feasibility of more than 143 proposed capabilities for AWA16.1, NIE 16.2 and AWA 17.1. Efforts resulted in 76 capabilities moving forward for participation in the LBRR and shaping the final Horseblanket and architecture for each event.</p> <p>- Provided AAE, PEO C3T and OSD with AMF Phases 3 analysis conducted at AWA 17.1 which provided most comprehensive look at airborne WNW performance through M&S, field and lab experimentations. Analysis provided inputs for PEO C3T AMF program RFP and other program milestones.</p> <p>- Developed and delivered AWA 16.1 and NIE 16.2 and AWA 17.1 Transport View and VALEX thread to support NIE/AWA.</p> <p>- Analyzed NIE and AWA schedule baselines to identify variances and their causes. Performed "what if" schedule analysis to support shifts to the planning and execution window for AWA 16.1, NIE 16.2 and AWA 17.1; resulting in the development of courses of action and ultimately shifts within the event process and execution.</p> <p>- Developed, coordinated and maintained up to date TIER 1 schedules for AWA 16.1 through NIE 19.1. Conducted weekly updates to all stakeholders which served to collaborate on multi-schedule key event process dates and decision points. Developed a "NIE/AWA Timing Overlay" that manage all key event milestone on to one chart.</p> <p>- Completed all formal industry and government correspondence requirements for AWA 16.1, NIE 16.2 and AWA 17.1. Efforts consisted of Solicitation, acceptance and rejection notifications, consolidation and summarization of final reports.</p> <p>- Coordinated and developed NIE 16.2/AWA 17.1 implementation plans as a result of TRADOC, LBRR and ATEC reports and recommendations. Efforts that ensured ASA(ALT) material developers had the opportunity to assess the feasibility of incorporating findings and lessons learned into their programs.</p> <p>- Developed, statused and maintained Integrated Master Schedules for AWA 16.2, AWA 17.1, and NIE 17.2. Ensured deliverables needed for lab based risk reduction (LBRR), network and platform integration, training, field support and logistics, and event battle rhythm/schedule supported successful execution.</p> <p>This effort also included all program, information, security, business, and personnel management efforts required to support the NIE/AWA. It included Program management; Contracting and financial management; Cost analysis; Personnel management; Operations; Security management; NIE event management; Information Assurance; Information management; Database and IT support; Facilities and infrastructure management; and, Knowledge management.</p>			
Accomplishments/Planned Programs Subtotals	44.164	-	-

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
• DY3: <i>NIE Test & Evaluation</i>	10.768	65.844	58.395	-	58.395	61.482	49.699	45.735	50.051	Continuing	Continuing
• DY4: <i>Network Integration Support</i>	13.700	-	-	-	-	-	-	-	-	0.000	13.700

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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 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY6 / <i>Brigade and Platform Integration 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>
• DY5: <i>Production/Field Coordination for Capability Sets</i>	3.486	3.960	4.261	-	4.261	4.349	4.434	4.524	4.502	Continuing	Continuing
• DY7: <i>Army Systems Engineering, Architecture & Analysis</i>	15.802	14.166	15.508	-	15.508	15.998	25.121	25.499	26.214	Continuing	Continuing
• DZ6: <i>Army Integration Management & Coordination</i>	8.366	5.746	6.775	-	6.775	6.922	7.065	7.217	7.367	Continuing	Continuing
• FG7: <i>Emerging Technology Initiatives</i>	-	56.939	60.421	-	60.421	39.991	39.985	35.995	41.020	Continuing	Continuing

Remarks

D. Acquisition Strategy

This project does not have any requirement for direct procurement of hardware or software.

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 / 5					R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>				Project (Number/Name) DY7 / <i>Army Systems Engineering, Architecture & Analysis</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
DY7: <i>Army Systems Engineering, Architecture & Analysis</i>	-	15.802	14.166	15.508	-	15.508	15.998	25.121	25.499	26.214	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides the Army's leadership and materiel developers with the necessary modernization planning, System of Systems (SoS) engineering, technical analysis, architectural products, critical path analysis, and risk analysis and mitigation planning to influence the Army's materiel portfolio. This project defines and executes its mission in the context of a SoS Engineering Management Plan (SoSEMP), that provides comprehensive engineering, analysis and architecture processes across early CS requirements and roadmap development; engineering and analysis tasks; lab and field risk reduction efforts; capability assessments, and unit-specific architectural planning support to boots-on-the-ground synchronized fielding execution. This project also funds Cyber Security engineering, architecture and development tasks necessary to create effective, affordable and secure network capabilities that address critical gaps, meet Mission Command Network (MCN) 2020 objectives and/or Force 2025 and Beyond (F2025B) initiatives. This project also funds engineering synchronization oversight and governance for the Army SoS Common Operating Environment (COE). This effort includes analysis of integrated capabilities, requirements decomposition and alignment, and resource and acquisition synchronization. This project includes support to other Department of Defense (DOD) and international agencies for joint programs and collaboration efforts.

Key tasks are Reference Architecture products; Architecture Planning Analysis, Integration and Coordination; Engineering Analysis and Design; Portfolio Analysis; Integrated Master Schedule (IMS); Integration Risk Identification, Mitigation, Plans and Reports; Strategic Process and Planning; Future Capability Sets Planning Integration and Engineering; CS Products and Services.

The effort includes costs for labor (Government and contractor), service contracts, travel, training, supplies, facilities, and Information Technology (IT) support.

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

	FY 2016	FY 2017	FY 2018
Title: Army System of System Engineering and Analysis	9.196	8.393	10.509
Description: Provide coordinated SoS engineering, architectures, and analysis products for integrating new technologies with existing capabilities to stakeholders (e.g. materiel developers, TRADOC Capability Manager (TCM), Army Capabilities Integration Center (ARCIC), etc.) to deliver integrated solutions to Army formations.			
FY 2016 Accomplishments:			
-Developed Capability Set roadmaps by leveraging the ASA(ALT) IMS data to support decisions on Program of record fielding and risk reduction efforts. and capturing critical path analysis to identify analysis/design, decision and POR delivery and fielding requirements for risk reduction, evaluation and fielding CS baselines per ARFORGEN.			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>-Provided specific and integrated roadmap products to manage programmatic coordination, integration and evaluation (i.e. NIE) of critical Network 16.2, COE, Cyber and the evolving F2025 requirements supporting Army Modernization.</p> <p>-Conducted strategic planning in support of MCN2020, F2025B, SoS integration & Fielding to include development of planning tools such as the ASA(ALT) IMS, SoSE&I IMS, COE IMS, MCN2020 Storyboard and Capability Roadmap Matrix. Tools that are leveraged by all of the stakeholder communities to include G3/5/7, PEOs, TRADOC and ATEC.</p> <p>-Executed and supported each process stage of the engineering and integration model by synchronizing PEO/PM development and test timelines (through the Integrated Master Schedule and Army planning activities), documenting CS design and architecture (at multiple levels of views/scope from Enterprise down to specific platform design) throughout the CS life cycle to include operational test and assessments aligned and executed within AWA 16.1, NIE 17.2 and AWA 17.1.</p> <p>-Conducted cross-organizational analysis of capabilities to refine MCN 2020 Focused End States, Detailed tasks and Objectives. Synchronizing program of record timelines with events and driving an incremental approach to accomplishing MCN 2020 objectives.</p> <p>-Executed analysis to support strategic decisions related to the WSR, POM, MCN 2020, F2025B. Efforts consisted of Integration Risk Identification, Development of Mitigation options, Plans, and Reports which resulted in the refinement of MCN 2020 Focused End States, Detailed tasks and Objectives and the synchronization program of record timelines with events to drive an executable incremental approach to accomplishing MCN 2020 objectives.</p> <p>-Provided G3/5/7 with Transport Convergence Medical Analysis ISO Focused end-state development and associated risk reductions (tactical network supportability of medical data from L1-L3 medical facilities risk reduction).</p> <p>-Provided ASA(ALT) with analysis into alternative transport architectures, to include flattened terrestrial architectures and Future narrow Band waveforms. Army is using FNB study to inform on alternative waveform solutions to WNW (e.g. MNVR AoA) and to improve tactical transport design and performance.</p> <p>-Provided ASA(ALT) with analysis into performance of LDR-radio based lower tier tactical network and Network Basis of Issues (NBOI) to support 2 Channel LDR Radio *Provided PM PNT with transport network supportability analysis for PM PNT Traffic. In support of PDR and Milestone B decision of Pseudolite PM PN&T program.</p>			

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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY7 / <i>Army Systems Engineering, Architecture & Analysis</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
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<p>-Provided PM PNT with Pseudolites performance analysis ISO RCO and PM PNT architecture development. Analysis provided key PNT performance metrics and their verification against PNT requirements</p> <p>-Developed and Delivered Reference architecture products for CS17-20 IBCT, CS21 SBCT, CS22 ABCT, and for CS19 Combat Aviation Brigade (CAB) to include integrated network basic of issue, SoS network View, Vehicle Interface Diagrams, SoS Threads to drive system of system and vehicle integration for IBCT/SBCT/ABCT/CAB.</p> <p>FY 2017 Plans: Army Formation Reference Architecture products: These funds provide for Subject Matter Expertise to develop and maintain System of Systems (SoS) architecture and integration products for all Army Combat Formations (Corps & below). These products are used to design Objective, Base, & Modified Table of Organization & Equipment (TOE), capabilities sets (CS), and demonstration/test environments (e.g. NIE, Operational Test, and Army Interoperability Certification). This effort also supports working groups such as the Network Synchronization Working Group (NSWG), and formal Army decision forums such as the SoS General Officer Steering Committee (SoS GOSC) and the Army's Land War Net GOSC (LWN GOSC). The four core reoccurring products are:</p> <ul style="list-style-type: none"> - Integrated Basis of Issue Plan (IBOIP): detailed database and spreadsheets describing the objective, basic, and modified TOE, TRADOC required BOI system placements, etc. - System of Systems View (SoS) Diagram: Visual reference document diagramming all Soldier and platform roles, and their network connectivity and waveform assignments to each other as dictated by the IBOIP. - Vehicle Interconnectivity Diagram (VID): Visual reference document diagramming software (operating systems, applications, etc), hardware (radios, computers, antennae's, routers/switches, etc.), internal/external networks (protocols, ports, gateways, etc.), and waveforms (frequency bands) are connected for individual platforms. - System of System (SoS) Thread: Visual reference diagram documenting technical use cases of the SoS architecture and the data/message flows throughout Brigade and below based on Army universal task lists, Army Interoperability Certification, and Joint Common System Function List. - Head Quarters Department of the Army (HQDA) Architecture inquiries: These funds provide for SMEs which respond to HQDA inquiries and it provides for developing and/or updating Army documents (e.g. regulations, exercise orders, directives, policies, etc.). Coordination with PEOs, ARSTAFF, FORSCOM units, and TRADOC 			
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>stakeholders to synchronize the development, maintenance and configuration management of capability sets for all Army formation types. This includes design information for COE, Cyber, and PNT.</p> <p>- Data/Configuration Management: These funds provide for maintaining consistency of architecture products that are leveraged by the Army community to develop capability gaps, operational exercises, and PoR development and integration activities. This includes the resourcing, planning, and IT systems to facilitate configuration management activities.</p> <p>- CS17 Products and Services: Engineering design and analysis of Infantry formations networks to verify operational capabilities, cost, and schedule can be met. Delivery of modified TOE architecture products to all units fielded during FY-17 to facilitate new equipment fielding of current formations CS17 Units 6 total: 2xInfantry Brigade Combat Teams (IBCTs) with lower tactical internet, 1xDIV HQ, 1xIBCT only dismounted radios, and 2xIBCT without lower tactical internet.</p> <p>- CS18 Products and Services: Engineering design and analysis of Infantry formations networks to verify operational capabilities, cost, and schedule can be met. Delivery of modified TOE architecture products to all units fielded during FY-17 to facilitate new equipment fielding of current formations CS18 Units 6 total: 1xIBCT with lower tactical internet, 1xANG Division HQ, 1xIBCT Division HQ, 1xIBCT only dismounted radios, and 2xIBCT without lower tactical internet.</p> <p>- Architecture Planning Analysis, Integration and Coordination: These funds provides the Army's leadership and materiel developers with the necessary Capability Set (CS) modernization planning, technical and risk analysis, mitigation planning, and system of systems engineering (SoSE). This project explicitly includes critical Common Operating Environment COE, Cyber, PNT as well as Division & Corps echelons as it pertains to architecture development to meet network 2020 and 2025 initiatives.</p> <p>- Engineering Support & Design: These funds provide SME support to the Army's Network Modernization Strategy (NMS) at both the tactical and enterprise levels. FY17 Network Modernization engineering will include support for Position Navigation & Timing (PNT) integration into the overall Capability Set design, Multinational/Mission Partner Environments architecture development, Army defensive and offensive cyber capabilities integrated at both the tactical and enterprise levels, network modernization risks and gaps for Corps level units and below, Army spectrum strategy, and COEv3+ modernization risks and gaps.</p> <p>- Portfolio Analysis:</p>				

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>These funds provide the Subject Matter Expertise to conduct Portfolio analysis across the entire Army portfolio of programs of record (PORs) and systems with an intent of maximizing Warfighter utility and effectiveness under cost, schedule and technology readiness constraints. Analysis in this area provides Army leadership with options to make sound analyses-driven investment decisions that optimize the overall acquisition portfolio warfighting function. Activity also standardizes the programs' data sets elements based on which program-level decisions can be made, as well as improves the overall methodology of the Army's portfolio analysis.</p> <p>- ASA(ALT) Integrated Master Schedule (IMS): These funds provide SME to maintain a reliable IMS that synchronizes Engineering, Architecture, Programs of Record (POR), Network Evaluation, and Capability Set (CS) fielding scheduled aligned to the POM and the Army's ARFORGEN cycles. Efforts to include implementation of networked IMS tools for POR input. Efforts to analyze Platform and MCN 2020 network components schedules to identify issues and opportunities.</p> <p>- SoSE&I Integrated Master Schedule: These funds provide SMEs to develop and maintain an Integrated Master Schedule (IMS) for internal deliverables supporting Capability Set Fielding, COE, Cyber, Architecture, Engineering Analysis and Risk Reduction, aligned to CS schedules and evaluation event activities.</p> <p>- Integration Risk Identification, Mitigation, Plans and Reports: These funds provide SME to conduct Integrated Risk Management enabled by ASA(ALT) IMS and MCN 2020 Focused End State objectives and tasks. It provides analysis of MCN 2020 FES objectives and tasks against ASA(ALT) IMS to identify risks to the delivery of Mission Command Network. Develop mitigation plans and coordinate and synchronize with PoRs to reduce risk. Identify opportunities to bring in capabilities early to formal Capability Set configurations through analysis of PEO portfolios and IMS, to include: Capability Risk Matrix, Mitigation Plans for MCN 2020 delivery, and tracking and statusing FES changes.</p> <p>- Strategic Process and Planning: These funds provide SME to incorporate ASA(ALT) network objectives into strategic planning for achievement of MCN 2020 focused end states and Force 2025B emerging solutions, to include: Strategic Planning Review events, Road map to MCN 2020 validation, Agile Process Standard Operating Procedure rewrite, Network Synchronization Working Group outcomes analysis, Proponent IPT, and Database development and improvements to track and report progress.</p> <p>- Future Capability Sets Planning Integration and Engineering: These funds provide for the advancement of collaboration and coordination between platforms, network systems, and enterprise services as part of the planning efforts required to complete a CS fielding. CS reference architecture products are the result of</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>this collaboration. CS reference architecture products enable CS fielding platform integration design decisions. They provide a synchronized and holistic description of how the Army network integrates into and functions for the FORSCOM units designated to receive a CS fielding.</p> <p>- CS16 Products and Services: Final close out of unit specific IBOIP, SoS View diagrams, VIDs, SoS Threads, Network Verification (NETVer), Non-Recurring Engineering (NRE), and configuration management for 1xIBCT with Lower Tactical Internet, 1xDIV HQ, and 3xIBCT without lower tactical internet.</p> <p>- CS17 Products and Services: Coordinate and communicate with PMs, TCMs, PEOs, ASA(ALT), G3/5/7, SoSE&I E&I, and other organizations within and outside of SoSE&I to ensure synchronization of CS baseline evaluation product program schedules. In collaboration with platform and network system PMs, document network system design, identify integration risks, and assist in the development of mitigation plans to help ensure schedule of CS fielding is executable.</p> <p>These funds also support the effort to:</p> <p>Evaluate, synchronize and ensure platform integration requirements are embedded in the performance scope for SoSE&I managed System Under Evaluation (SUE) production RFPs in collaboration and coordination with platform PMs, network system PMs, and the SoSE&I Engineering Planning and System Integration (EPSI) Division. Adjudicate and resolve operational, technical, and programmatic issues for initial and RA products in collaboration and coordination with SoSE&I E&I, platform PMs, network system PMs, and TRADOC Capability Managers (TCMs). Evaluate, synchronize, and monitor the development of the CS 17 unit specific architecture products, as defined by NIE evaluation results, in collaboration and coordination with SoSE&I E&I and the SoSE&I Capability Package (CP) Synchronized Fielding (SF) - Engineering Division (ED). Evaluate the development of RA products required for SF tasks/mission accomplishments utilizing architecture inputs (e.g., TVs, Mission Threads, Validation Exercise, etc.) from NIEs.</p> <p>Develop, update, and finalize the CS 17 unit specific SoS view architecture, from Brigade Headquarters to dismounted soldier, and the detailed engineering VIDs, details how CS and legacy equipment will be connected within the vehicle from the CS aggregated network vehicle (golden vehicle) list produced by the Production Design and Integration team. Plan, coordinate, and assess Safety Release/Safety Confirmation (SR/SC) testing for CS Golden Vehicle designs. Coordinate with SF fielding team for planning and execution of SR/SC and materiel release planning to support CS unit fielding.</p>				

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

Coordinate with associated SoSE&I Directorates for the management, engineering, integration, testing, and delivery of platforms with integrated network equipment for CS evaluation, testing, and fielding. Incorporate the CS 17 unit specific architecture product schedules into the IMS. Develop the CS NRE configurations for reference and unit specific IBOIP architectures consisting of multiple network systems on multiple configurations of Mine Resistant Ambush Protected (MRAP) vehicles, the family of High Mobility, Multipurpose Wheeled Vehicles (HMMWVs), as well as other ground combat, combat support, and combat service support platforms for multiple roles in across an IBCT.

Perform and document Configuration Management (CM) of unit specific vehicle network architecture designs, (e.g. IBOIPs, SoS views, VIDs, Threads, etc). Develop, coordinate, and assess test mission threads from NIE and CS to exercise data flows within the network and vehicles to verify network requirements and message functionality. Plan, coordinate, and participate in CS NETVer events to verify CS designs and ensure the functionality of CS production equipment.

- CS18-22 Products and Services:
Coordinate and communicate with PMs, TCMs, PEOs, ASA(ALT), G3/5/7, SoSE&I E&I, and other organizations within and outside of SoSE&I to ensure synchronization of CS baseline evaluation product program schedules. In collaboration with platform and network system PMs, document network system design, identify integration risks, and assist in the development of mitigation plans to help ensure schedule of CS fielding is executable.

Coordinate with associated SoSE&I Directorates for the management, engineering, integration, testing, and delivery of platforms with integrated network equipment for CS evaluation, testing, and fielding. Analyze Objective Table of Organization and Equipment (OTOE), network system PMs' equipment fielding plans, and platform PMs' engineering and modernization schedules in order to develop, update, and finalize a CS reference INBOIP, SoS view architecture, and VIDs and incorporate these architecture products into the IMS. Develop the CS NRE configurations for reference IBOIP architectures consisting of multiple network systems on multiple configurations of Mine Resistant Abrams, Bradley, Stryker, Armored Multi-Purpose Vehicle (AMPV), Ambush Protected (MRAP) vehicles, the family of High Mobility, Multipurpose Wheeled Vehicles (HMMWVs), as well as other ground combat, combat support, and combat service support platforms for multiple roles in across an IBCT, Stryker Brigade Combat Team (SBCT), and Armored Brigade Combat Team (ABCT).

Effort to develop and maintain Capability Set and Sync Fielding specific IMS:
These funds provide SME to develop and maintain an Integrated Master Schedule for the Army's Capability Set – Synchronized Fielding efforts. Close out the IMS for FY16, maintain the IMS for FY17 and develop initial IMSs for FYs, 18, 19 and 20. Collect and analyze sub-schedule performance against the baseline IMS to identify schedule risks for the Army's Capability Set – Synchronized Fielding (CS-SF) efforts. Validate that established integration points are achievable and, if not, identify the schedule risk. Analyze schedule performance against schedule baseline, identify variances and their causes, and identify risks and/or

FY 2016	FY 2017	FY 2018

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>impacts to critical path. Perform “what if” schedule analysis of alternative program courses of action to determine impact on schedule critical path. Update and post Schedules on SharePoint for visibility and increased collaboration across ASA(ALT). Participate in After Action Reviews, Lessons Learned, Synchronized Fielding Technical Exchange Meetings (TEMs). Provide scheduling reports and briefings to meet the needs of the CS-SF community. It also includes: Capability Sync Fielding IMS and briefings and reports from IMS analysis.</p> <p>To synchronize, develop and publish across Army’s PEOs analytical community FY17 integrated network analysis plan, concentrating on cross-PEO network integration and performance issues analysis. Execute this plan to deliver several strategic ASA(ALT) whitepapers on key Army’s future technologies affecting network 2020 and Network 2025 acquisition-level decisions. Develop and execute key Analyses in the areas of technical requirements and performance related to Army’s transport convergence initiative for Logistical and medical data and Intel-related operations, Army spectral assignment risk mitigation strategy.</p> <p>In response to GAO guidance, to further baseline and trend Integrated Network capability set CS18/19 performance in NIE 17.1/17.2 events using Army DAE-approved Key technical indicators (KTIs). Using ATEC instrumented NIE 17.1/17.2 analyzed and evaluated KTIs from key SoS performance metrics and another key survey-driven SoS technical factors. Taking together, these multiple key indicator measurements will show integrated network SoS technical performance trends against the baseline. When these standardized measurements are repeated at NIEs, important trends associated with network SoS objective performance and operational capability are observed and reported to AEE and DAE.</p> <p>FY 2018 Plans: Army Formation Reference Architecture products: Develop and maintain all Army Combat Formations (Corps & below) SoS architecture and integration products. These products are used to design Objective, Base, and Modified Table of Organization & Equipment (TOE) for demonstration/test environments (e.g. NIE, Operational Test, and Army Interoperability Certification).</p> <p>Four core recurring products are: - Integrated Basis of Issue Plan (IBOIP): detailed database and spreadsheets describing the objective, basic, and modified TOE, TRADOC required BOI system placements, etc. - SoS View Diagram: Visual reference document diagramming all Soldier and platform roles, and their network connectivity and waveform assignments to each other as dictated by the IBOIP. - Vehicle Interconnectivity Diagram (VID): Visual reference document diagramming software (operating systems, applications, etc), hardware (radios, computers, antennae’s, routers/switches, etc.), internal/external networks (protocols, ports, gateways, etc.), and waveforms (frequency bands) are connected for individual platforms.</p>				

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>- SoS Thread: Visual reference diagram documenting technical use cases of the SoS architecture and the data/message flows throughout Brigade and below based on Army universal task lists, Army Interoperability Certification, and Joint Common System Function List.</p> <p>Architecture Planning Analysis, Integration and Coordination: These funds provide for the development of products which are necessary for modernization planning, technical and risk analysis, mitigation planning, and SoS engineering. It includes Cyber and Position Navigation & Timing (PNT) as well as Division & Corps echelons as it pertains to architecture development to meet MCN 2020 and F2025B initiatives.</p> <p>Engineering Analysis & Design: These funds provide support to the Army's Network Modernization Strategy (NMS) and Capability Needs Assessment (CNA) at the tactical and enterprise levels. Network Modernization engineering will include support for PNT integration into the overall CS design, Multinational/Mission Partner Environments architecture development, Army defensive/offensive cyber capabilities integrated at both the tactical and enterprise levels, network modernization risks/gaps for Corps level units and below, and Army spectrum strategy.</p> <p>Analyze Programs of Record (PoRs) and emerging technologies to maximize Warfighter effectiveness under cost, within schedule and meeting technology readiness constraints. Perform cross-PEO integration and performance issues analysis. Develop strategic plans for providing key technologies in support of Army gaps. Conduct analyses of technical and performance requirements to support technology insertion for Warfighter capability (ie. Intel-related operations, spectral assignment risk mitigation, and PNT architecture placement).</p> <p>IMS: These funds provide a reliable IMS that synchronizes engineering, architecture, PoRs, network evaluation, and CS fielding schedules to ensure their alignment to the Program Objective Memorandum (POM) and the Army Force Generation (ARFORGEN) cycles. Efforts include implementation of IMS tools for POR input, analyses of Platform schedules, and MCN 2020 network components schedules to identify issues and opportunities. These funds also provide for analysis of Program Executive Office (PEO) portfolios and their IMS which identifies opportunities to incorporate capabilities earlier into CS configurations.</p> <p>Integration Risk Identification, Mitigation, Plans and Reports: These funds provide strategic planning in support of network modernization objectives and CNA efforts. It provides analysis of objectives, potential risks and mitigation plans to capability delivery.</p> <p>Strategic Process and Planning:</p>				

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>These funds provide for strategic planning to achieve MCN 2020 FES, F2025B, and emerging solutions, to include: Strategic Planning Review events, Road map to MCN 2020 validation, Agile Process Standard Operating Procedure adaptation for rapid acquisition, Network Synchronization Working Group outcomes analysis, Proponent Integrated Product Teams (IPT), and database improvements to track/report progress.</p> <p>- Integration Engineering Planning and Execution of Capability Sets (IEP&E-CS): These funds provide for the advanced collaboration and coordination with platform and network system Product Managers (PdMs) to ensure CS Fielding platform integration design decisions are based on CS Reference Architecture products for CS18-23 to be evaluated in Network Integration Evaluation (NIE) events. Develop the Unit-specific architecture (e.g., Network Basis of Issue (NBOI), Unit Transport Design (TD), etc.) for CS Fieldings. Engineering coordination with platform and equipment integrators to ensure component level equipment is designed to meet platform level integrated design requirements established in the Unit NBOI and validate the integrated architecture design is functional. Develop the unit integration design for each CS. Update and transition architecture products to stakeholders by utilizing Unit specific NBOIs based on property book/maintenance analysis and physical inventory comparisons of Forces Command (FORSCOM) assets. Assess, synchronize, and status the production and installation of CS products and processes for platform integration and installation at the integration facilities to meet delivery schedules. Document and continuously improve engineering activities and process flows for efficiencies. Work with stakeholders to resolve problems such as conflicting requirements, funding and priorities. Seek innovative solutions to efficiently accomplish multiple efforts within allocated resources. Develop CS engineering products to include processes, schedule, established technical baselines through Technical Exchange Meetings (TEMs) and synchronization across stakeholder organizations.</p> <p>- IEP&E-CS: CS18 Synchronize and monitor platform and network system Size, Weight and Power (SWaP) assessment of Unit specific Architectures in collaboration and coordination with platform and network system PMs. Coordinate NRE funding requirements and delivery/ production schedules with the Synchronized Fielding (SF) – Fielding team to ensure production schedules are met to field selected systems. Develop, update, and finalize the unit specific NBOI, assist in site inventory and analysis, develop CS vehicle/ equipment configurations, develop the CS Non-Recurring Engineering (NRE) integration configurations for design (based on NIE Original Equipment Manufacturer involvement). Provide integration status of equipment designs by platform, role, echelon and by BCT for the following CS18 Units (five (5) total): field upgrade to LTI to two (2) Total Army Analysis (TAA) 2020 IBCTs, one (1) TAA 2020 IBCT (OCONUS), one (1) TAA ARNG IBCT and one (1) ARNG Division Headquarters (HQs).</p> <p>- IEP&E-CS; CS19 Products and Services: Evaluate, synchronize, and monitor platform and network system program acquisition schedules, integration costs, and system requirements across organizations for the development of production ready A&B-kit Interface Control Documents (ICDs) and</p>			

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

	FY 2016	FY 2017	FY 2018
<p>Level II Technical Data Packages (TDPs) supporting CS19 Unit specific baseline evaluations in collaboration and coordination with platform and network system PMs. Synchronize CS program schedules through coordination and communication with System of Systems Engineering and Integration (SoSE&I) Engineering and Integration (E&I) and other organizations within and outside of SoSE&I. Coordinate with associated PoRs for the integration, forecasting, procurement, testing and delivery of platform integrated Network equipment for CS baseline evaluations. Vet NBOIs with vehicle and equipment PMs, TCMs, PEOs, G3/5/7 and other stakeholders. Develop, coordinate, document and assess the updated and final LTI integration activities on 700+ platforms and evaluate the integration flow of multiple production lines of numerous platform types. Develop, update, and finalize the Unit specific NBOIs (one for each Unit touched) and are then vetted with platform and equipment PMs, TRADOC Capability Managers (TCMs), Program Executive Offices (PEOs), G3/5/7, FORSCOM and other stakeholders. Perform Property Book Unit Supply Enhanced (PBUSE) and Standard Army Maintenance System (SAMS) unit analyses to determine the serial and bumper numbers that are used to align platform roles by echelon (based on the Modified Table of Organization and Equipment (MTOE) and Objective Table of Organization and Equipment (OTOE)). Assist in Unit Inventories to confirm vehicle and legacy equipment configurations, confirm vehicle roles and identify/coordinate in lieu of vehicles for shortages. Develop NRE designs for platform and equipment (legacy and CS) configurations that will be required for Safety Release/Confirmation (SR/SC) testing. Coordinate with platform PMs the NRE configurations that are combined to develop a CS Golden platform design candidate list to minimize SR/SC costs. Monitor and assess the development and maturation of the A-kit design and ensure the installation manuals and technical data packages produce a repeatable and consistent integration process to support new equipment fieldings.</p> <p>- IEP&E-CS; CS20-23 Products and Services: Evaluate and synchronize platform and network system SWaP assessment of Network Architectures in collaboration and coordination with platform and network system PMs in support of the CS20-23 Reference Architectures. Evaluate, synchronize, and track platform and network system integration risks and mitigation plans for execution to the NBOI identified in collaboration and coordination with platform and network system PMs. Evaluate, synchronize and track disconnects in platform and network system program acquisition schedules, integration costs, and system requirements across organizations for the development of production ready A&B-kit ICDs and Level II TDPs supporting CS20-23 baseline evaluations. Resolve and elevate operational, technical and programmatic issues for Initial and Reference Architecture Products in collaboration and coordination with SoSE&I-E&I, platform PMs, network system PMs and TCMs. Synchronize CS program schedules through coordination and communication with other organizations within and outside of SoSE&I. Coordinate with associated PoRs for the management, integration, forecasting, procurement, testing and delivery of platform integrated Network equipment for CS baseline evaluations. Support PMs and PEOs in resolution of tasks associated with Network integration. Evaluate, synchronize, and track PM implementation of Vehicular Integration for Command, Control, Communication, Computers, Intelligence, Surveillance, Reconnaissance (C4ISR) / Electronic Warfare (EW) Interoperability</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
(VICTORY) standards in Initial and CS20-23 Reference Architecture products. Begin the planning for CS20-23 Unit specific NBOI requirements and develop and coordinate the IMS with all stakeholders.				
Title: Common Operating Environment (COE)		2.957	3.154	1.161
<p>Description: Provide Engineering Synchronization Oversight and Governance for the Army SoS Common Operating Environment (COE); provide integrated, cross-portfolio system engineering, architecture products and cost benefit analysis and synchronized acquisition planning for COE crossing multiple PEOs and Computing Environments (CEs); provide SoS requirements decomposition; conduct COE related Verification & Validation (V&V) planning and assessment; and serve as the DA Staff advocate for COE and Cross Cutting Capabilities (CCCs). Serve as the Trail Boss for ASA (ALT) I2E.</p> <p>FY 2016 Accomplishments: The funds provided the following: Given the successful development and broad adoption of the Common Operating Environment System of Systems Engineering documentation, particularly the COE Technical Reference Model establishing the ideal of a modular services layer to be used in common by all applications within a computing environment, COE has moved into implementation. For example PEO C3T awarded a contract to provide the Command Post Computing Environment services layer and Software Development Kit in early 2017. FY 2016 funding support work to begin COE implementation now underway and transform the organization to enable full life-cycle application integration and testing through fielding, implementation focused governance, and cross-PEO architecture integration and system of systems engineering coordination. Funds support reorganization and refocusing of the COE Division; reorganization included halving the size of the organization, reorienting staff toward the new focus on governance, architecture and standards, and integration and interoperability testing, briefing stakeholder organizations, and recognizing departing staff. Supported development of the Army Software Re-baselining Execution Order which will reduce the number of fielded SW baselines. Conducted the stakeholder outreach and project staffing leading to the early FY17 decision to place the Command Post Computing Environment under a single PEO lead.</p> <p>--Orchestration and COE Governance Execution: Supported development of Focused End State 2 (Transition to COE) as part of the Army's Mission Command Network Strategy, identified by TRADOC as one of five operational requirements with key enterprise dependencies. Provided development and maintenance of the COE Integrated Master Schedule, oversight of Computing Environment (CE) Working Groups (WGs) conducting cross-CE coordination and conflict resolution efforts, and ASA (ALT) support for the Army Staff Network Synchronization efforts. Chaired the Technical Advisory Board (TAB) the primary COE governance body. Supported COE STRATCOM development and industry engagement, including business case development. Developed and staffed for approval the FY16 annual AAE System of Systems (SoS) directive which guided evolution of the Army SW Baseline, and Standards & Specification adoption across ASA(ALT), (OSD/Joint), Development Planning model. Led OSD and Services study team that prepared and published: "Better Buying Power 3.0: Use Modular Open Systems Architecture to Stimulate Innovation: Findings and Recommendations of the Study Team". Revised the COE SharePoint Portal to organize the</p>				

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

	FY 2016	FY 2017	FY 2018
<p>information around the COE Technical Baseline. Converged COE Technical Advisory Board (TAB) and Engineering Libraries to allow TAB–approval of engineering documents to immediately populate the technical baseline.</p> <p>--SoS Engineering: Supported early stage development of COE JCIDS requirements documents leading to staffing of Computing Environment Integrated Capabilities Documents in FY 17 for approval by the Army Requirements Oversight Council and preparing the way to discontinue issuing annual SoS Systems Engineering Directives in FY 18. Developed the COE Integrated System Engineering Plan (ISEP). Completed reviews of CE Execution Plans (EPs), System Engineering Plans (SEPs) and SoS Engineering Management Plans (SoSEMPs). Provided COE Technical Baseline Development support including a Technical Roadmap for the Programs of Record (POR) for future capability development and software integration within the COE. Provided development of COE Engineering Change Proposals (ECPs) and vetting. Provided SoS engineering and analysis to synchronize PoR migration to COE CCC / Enabling Technology (ET) engineering and prioritization, implementation plan updates, building and publishing the COE Technical Reference Model, Standards WG, Resource WG, and Schedule WG management, and cross-CE and PEO SoS engineering support. Published COE Business Rules to enable PMs to provide information for the Program Objective Memorandum (POM). Coordinated the incorporation of COE Program Reviews directly into Weapon System Reviews (WSRs); before this year COE information was briefed separately. Coordinated a G-8, ASA(ALT) review of pending COE Decisions, leading to LandWarNet Council of Colonels prioritization for resolution. Guided COE/CE architecture development by developing stakeholder approve integrated architecture templates, cited as a (Model-based System Engineering) best practice. Developed scripts and a COE v3 standards library module in MagicDraw to help CE architects auto-generate CE Information Systems (IS) Capability Development Document (CDD) architecture products and Standard Views (StdVs). Developed DoDAF products for the Standard & Sharable Geospatial Foundation (SSGF), Common Overlay, and Machine-to-Machine Messaging Enabling Technologies (ETs). Managed architectures for Command Post (CP) CE, Mounted CE (MCE), Mobile/Handheld CE (M/HHCE) in the COE Integrated Architecture Environment hosted at TRADOC Architecture, Information Management and Knowledge Element (AIMKE). Assisted CE and ET leads with developing DoDAF products as part of their CE architectures in the COE Integrated Architecture Environment and Detailed-Engineering Change Proposals.</p> <p>-- Technical Management: Provided technical support to oversee execution of the COE Implementation Plan and DA COE EXORD compliance and execution, including Cost Benefit Analysis (CBA), tasking management, Modular Open System Architecture Guidance development and implementation, verification of COE critical enabler implementation, and risk assessments and analysis. Supported development of standards, evaluation strategy and transition plan for the SoSE&I Systems Engineering and Technical Assistance (SETA) contract consolidation. In addition, the COE Directorate internally evaluated contract support and reduced support by 42% (from 14 to 8 contracts). Supported COE STRATCOM development and industry engagement—including publication of “COE” a flip book used in conjunction with the Association of the US Army Conference.</p> <p>--Testing, Certification and Fielding Preparation: Supported development of the COE Integration and Assessment Plan (CIAP) and executed the conceptual work and organizational outreach needed to develop the COE Federated Integration Environment (FIE) a networking of lab facilities to allow PMs to test applications on the full tactical network. The FIE will also allow TRADOC to experiment with force structure alternatives and develop doctrine, tactics, technics and procedures early in the COE development</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>cycle. Supported the development of an Integrated Test Strategy baseline for COE. Supported integration, validation, and verification of PORs in preparation for certification testing. Provided Control Point/interface specifications. Provided Software Version COE Configuration Control Board (CCB) support. Provided accreditation and certification process refinement. Conducted Integration Readiness Review for COE v1.1, and supported execution of the COE v1.1 Interoperability and Integration Event (I2E).</p> <p>FY 2017 Plans: Common Operating Environment Synchronization, Governance, Resource Planning and Implementation Oversight: These funds provide Engineering, Orchestration, Oversight and Governance for the Army COE on behalf of the Army Acquisition Executive under the direction of the Executive Director System of Systems Engineering and Integration COE Synchronization, Governance, Resource Planning and Implementation functions: Synchronize the activities of 6 Computing Environment (CE) Working Groups, 11 Program Executive Offices, and 163 Programs of Record (PORs) to deliver the COE materiel solution necessary for the Army to field the Tactical Network envisioned in Mission Command 2020 and Mission Command 2025 guidance documents. Lead Policy Planning and Coordination with the Land/War/Net Mission Command Directorate of the G3/5/7 regarding the COE Execution Order (EXORD) and the Army Focused End-States initiative. Advise the Executive Director System of Systems Engineering and Integration and the Army Acquisition Executive on COE matters, provide assessments and reports, and prepares information to support Decision-making. Coordinates with Research Development and Engineering Centers by providing planning input for technical enabler development by COE version (v3, v4, and v5). Lead the System of Systems Engineering product development—the standards, architecture, specifications, certification guidance, and priorities guidance necessary to build the COE. Provide analysis and planning information to inform the Long Range Analysis. Process, including schedules, funding assessments, and decision support analysis. Manage COE participation in Weapons System Reviews (WSR) by developing yearly ‘business process guidance’ that structures how Program Managers allocate resources to inform WSR decisions and leads the COE Resource Management Working Group. Develop strategic communications to inform the Army Staff, the Acquisition. Develop Community, Industry and Government regarding the COE long term strategy.</p> <p>- Common Operating Environment System of Systems Engineering: These funds provides integrated, cross-portfolio system engineering, architecture products and cost benefit analysis and synchronized Acquisition planning for COE crossing multiple Program Executive Offices and Computing Environments (CEs).</p> <p>- The funds support COE System of System Engineering activities such as: Oversee and guide Computing Environment activities on behalf of the AAE by chairing the COE Technical Advisory Board (TAB) which is composed of the 6 CE Working Groups and 8 Program Executive Office Senior Engineers. Serve as the COE Technical Advisory Board Secretariat. Develop and schedule issues for decision. Authors and clears authoritative decision records. Develop the Annual System of Systems Directive for signature by the Army Acquisition Executive that provides program guidance to PORs. Develop Systems Engineering technical baseline guidance, standards, control point specifications, and</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>templates for multiple COE versions in simultaneous development: COE v3, v4, and COE v5. All are currently in progress and at various stages of maturity. Manage COE Systems Migration Binning List which aligns systems against COE objectives. Identify, manage and vet engineering assessments and Engineering Change Proposals for Cross-Cutting Capabilities. Establishes CCC development priorities, monitors and reports on progress for 19 CCCs. Develop and update the COE Technical Reference Model—the basic logical system design for COE versions. Develop and update the COE Technical Roadmap, which provides guidance for the migration of Program of Record Systems to the COE. Coordinate systems engineering and architecture support to the development of the Integrated Systems-Capabilities Development Document and follow-ons. Develop and maintain, Control Point Specifications, the primary standard by which interoperability and backward compatibility will be maintained and assessed among COE versions. Conduct COE v3 Integration of the CEs to develop the COE v3 baseline. Lead COE Systems Management Planning: the identification of systems that will migrate to the COE infrastructure, by fielded in COE compatible versions, or divested. Monitors and reports on planning. Assesses support Systems Engineering Plans for systems that will migrate to COE. Lead Integrated Architecture Team by providing COE architecture development guidance to supporting architects in other organizations, integrating architecture contributions, and assessing products. Monitors and assesses Computing Environment Architectures developed by Program Executive Offices. Provides system of systems analysis and advice to TRADOC operational architects and CIO/G-6 technical standards developers. Develop and coordinate the COE Integrated Master Schedule that integrates 2680 lines of activities. Integrates CE WG schedules. Develop, coordinate, and published annual updates to the COE Integrated Systems, Engineering Plan and 14 annexes. Develop, codify, monitor and report COE Performance, Schedule, and Cost Metrics. Leads the COE Standards Working Group.</p> <p>- Common Operating Environment (COE) Technical Data Management: The funds provide cost benefit analysis, planning coordination with G3/5/7 and Training and Doctrine Command Battle-labs, Capability Development Document Coordination, Data Management, Operations and Tasking; Focused End-State 2 lead.</p> <p>- The funding provides the following COE Technical Data Management functions: Lead the Focused Endstate 2 Working Group—the Army Staff planning and policy group for the Common Operating Environment. Provides analysis to support weekly Councils of Colonels meetings to regarding Focus Endstate objectives, measures of performance, and execution monitoring.</p> <p>Provide Data Management of COE policy, guidance, specifications, Engineering Change Proposals, architecture that together provide 6 Computing Environment stakeholder communities, 185 Program Managers, TRADOC Centers of Excellence, and Army Staff element the technical, resource, and guidance information needed to build COE compliant products. Provides configuration management documents including version control, discovery of current data, data archiving, and Meta data policy. Develops SharePoint pages and applications to provide collaboration services, library storage, database services, and community tailored access. Manages information access and oversees 6 Computing Environment sub-sites.</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>Conduct COE cost analysis to support COE related decision bodies (SoS GOSC, LWN GOSC). Manage COE tasking affecting 8 PEOs, 6 Computing environments to allow COE to gather information and convey Army Acquisition Executive direction to the COE materiel development community. Manage the Better Buying Power 3.0 Modular Open System Architecture initiative, including contract support coordination, data management, data collection, analysis, weekly meetings, monthly meetings at the Service and Department Acquisition Executive level, and four major deliverables. Requires multi-Service coordination and Industry Outreach. Ensure coordination of Geospatial products: Requirements, Architecture, Engineering, Implementation, Integration, Assessment, and Certification activities associated with the Common Overlay Cross-Cutting Capability and Command Post Computing Environment application development. Provide analysis and information to the Mission Command Requirement Governance Team regarding COE level Capabilities Development Documents. Coordinate with and provides Systems of Systems Engineering Analysis products and recommendations to the TRADOC Battle Labs, especially COE materials to support Modeling and Simulation.</p> <p>- Common Operating Environment Certification: The funds provide for conducting COE certification planning and execution with 8 Program Executive Offices, 30 Program Manager (PM) /Product offices, Training and Doctrine Command (TRADOC), G-3/57, and Chief Information Officer (CIO)/G-6). Integration and Interoperability Event (I2E) lead for the Assistant Secretary of the Army for Acquisition, Logistics and Technology. To include: Monitor COE Integrated System Engineering Plan (ISEP)-required Phase 2 (Computing Environment) and Phase 3 (System of System COE) Software integration activities for COE versions 3 and 4; and provide COE Integration status to Land/War/Net Mission Command (LM) General Officer Steering Council (GOSC) and System of Systems GOSC with metrics and reports. Coordinate Title 10 software integration activities across eight Program Executive Officer (PEOs) and over 30 Program Manager (PM) /Product offices at CIO)/G-6 interoperability test control hub site (per DA PAM 25-1-1) for regulation-mandated Army Interoperability Certification (AIC) preparation, including managing synchronization of PEOs/PMs/CEs delivery of Hardware, Software and engineering support for System of Systems Integration. Co-chair Configuration Control board with G-3/5/7 to determine which systems, by software versions, are coming to biannual AIC events (through evaluation of operational and technical risk reduction impact) across multiple developmental and fielded tactical network baselines. Co-chair Executive Scoring Committee (with TRADOC and CIO/G-6) to adjudicate AIC test incident reports and monitor resolution to closure. Coordinate with CIO/G-6 for conduct of Certification Readiness Reviews for each AIC test event. Mediate between PEOs/PMs for adjudication of requirements Engineering Change Proposals (through a Program Change Request process) with TRADOC. Conduct daily hot-wash detailed engineering coordination sessions with integration engineers distributed across the Federation of Net-Centric sites an accredited network at six locations. Monitor and report IAVA and Configuration Management scan processes status at multiple integration sites for Cyber defense certification preparation. Validate test floor architecture and test case development for integration and testing at CIO/G-6-designated sites. Make recommendation through Executive Director SoSE&I to HQDA CIO/G-6 and G-3/5/7 when progress at I2E is sufficient to state that</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>the baseline is ready to enter formal AIC test. Provide System of System engineering analysis to the Focused End-State 4 working group regarding Mission Command Network Interoperability with Joint, NATO and Coalition Networks.</p> <p>- Common Operating Environment Systems Engineering and Integration Support: The funds support system of systems engineering planning associated with the Operational Assessment and Test venues: Coordinates with 6 Common Environment (CE) Working Groups (WG)s and over 30 Programs of Record to align materiel development schedules, risk mitigation events, against operational assessment venues. Assesses Performance, Schedule, and Cost risks to support decisions associated with COE version baseline fielding and test planning by the G3/5/7 and CIO/G6.</p> <p>- Effort to develop and maintain COE specific IMS: These funds provide SMEs to develop and maintain an Integrated Master Schedules for SoSE&I's Common Operating Environment (COE) efforts. Close out the IMS for FY16, maintain the IMSs for FY17 and develop initial IMSs for FY18 and FY19. In support of COE efforts collect and analyze sub-schedule performance against the baseline Integrated Master Schedule to identify schedule risks. Validate that established integration points are achievable and, if not, identify the schedule risk. Analyze schedule performance against schedule baseline, identify variances and their causes, and identify risks and/or impacts to critical path. Perform "what if" schedule analysis of alternative program courses of action to determine impact on schedule critical path. Update and post Schedules on SharePoint for visibility and increased collaboration across ASA(ALT). Participate in COE working groups. Provide scheduling reports and briefings to meet the needs of the COE communities. It also includes: COE IMS and briefing and reports from IMS analysis.</p> <p>- Mission Command COE Architecture: These funds provides the Army's leadership and materiel developers with the necessary modernization planning, critical path analysis, risk analysis and mitigation planning, system of systems engineering (SOSE), technical analysis and architectural products to support Common Operating Environment (COE) development. This project explicitly includes critical COE architecture and governance development tasks. Conduct Verification &Validation (V&V) of Common Element Integrated System Capability Development Document (CDD) Standard Views (SV) and Service View (SvcV) architecture products. It is ASA(ALT)'s responsibility to V&V the Joint Capabilities Integration Development System (JCIDS) Standard View (SV) and SvcV Department of Defense Architecture Framework (DoDAF) products for submission as a Capability Development Document (CDD).</p> <p>Perform; V&V on the COE v1.0/v1.10 Integrated Architecture/Basis of Issue/Capability Set level SVs and SvcVs architectures in preparation for AIC and operational testing, and V&V on the v3.0 COE Integrated Architecture. Positioning Navigation Timing (PNT) Command Control Communication (CCC) System of System architecture will be included. Align the CE-Level DoDAF Architecture Design in MagicDraw according to the guidance strategized out in the MC to avoid duplication in document</p>			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>development across ASA(ALT). This includes supporting the TRADOC Sun Setting Process for current requirements documents and the ASA (ALT) COE requirements convergence strategy, with a feed into COE and Capability Set Architecture.</p> <p>Detailed Tasks include: Build Trace for the COE requirements and their relations to other source and authoritative documents using the Army IRF. This includes the requirements for Position, Navigation, and Timing (PNT) CCC, Standard and Sharable Geospatial Foundation CCC, Common Overlay CCC, and Chat CCC. Develop and manage COE SoS Technical Requirements (Functional and Non Functional Requirements) including Requirements for Position, Navigation, and Timing (PNT) CCC, Standard and Sharable Geospatial Foundation CCC, Common Overlay CCC, and Chat CCC. Define and Build Trace between COE Technical Requirements and required COE/CE Architecture products.</p> <p>Provide guidance document, SOPs, training, IT support to the COE/CE users to develop the COE/CE requirements including Position, Navigation, and Timing (PNT) IPT. Conduct COE requirements convergence analysis using Army IRF to identify requirements duplications, commonalities, gaps, and define how current COE system requirements will be re-architected in terms of apps, widgets, and services to support the COE v3.0 and beyond-Provide and maintain the Army IRF Environment for the COE/CE community to develop COE/CEs/CCCs requirements. The environment currently has over 160 documents (35 Army Concepts Documents, 88 JCIDS Operational Requirements Documents, 35 Documents that identifies Army Gaps, 10 Authoritative and references documents needed for developing requirements and architecture products). Provide guidance and support to the current Army IRF Users in developing and managing SoS requirements for COE /CE/ CCCs requirements (PEO C3T, PM MC, PM APNT, SoSE&I, MC RGT, MC CoE) and new users. Use Case to generate the Unified System/Service DoDAF Product Design for COE Integrated Architecture v3.0. Assess the readiness of the Integrated Architecture against the Control Point Specifications for COE v3.0. Continue architecture product evolution in Magic Draw of the Unified System/Service DoDAF Product Design for COE Integrated Architecture for v4.0 and v5.0. Changes and updates will be vetted with the COE Architecture IPT at the appropriate time. Support Risk Assessment of emerging COE architectures for Cyber impacts.</p> <p>- System of System Common Operating Environment Requirements Engineering: These funds provides SoSE&I, Program Managers and TRADOC with the necessary Subject Matter Expertise (SME) to develop, analyze, and manage the complexity of the Common Operating Environment (COE) Requirements, existing Program of Record (POR)/systems requirements, Cross-Cutting Capabilities (CCCs), the new Computing Environment (CE)-level documents and governance and coordination of the Federated Integration Environment (FIE). The FIE reduces risk by supporting integration and interim operability assessments throughout the product lifecycle using a Phases Integration approach.</p> <p>FY 2018 Plans:</p>				

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Engineering Synchronization Oversight and Governance for the Army SoS Common Operating Environment (COE); cross-portfolio system engineering and architecture products; synchronize acquisition planning for COE crossing multiple PEOs and Computing Environments (CEs); and serve as the DA Staff advocate for COE and Cross Cutting Capabilities (CCCs).</p> <p>These funds provide continued Oversight and Governance for the Army COE on behalf of the Army Acquisition Executive to include Synchronization of planned COE efforts to deliver the COE materiel solution necessary for the Army to field the Tactical Network envisioned in Mission Command 2020 and Mission Command 2025 guidance. Lead the COE Standards Working Group and provide Data Management of COE policy, guidance, specifications, Engineering Change Proposals, architecture. Advise the Executive Director System of Systems Engineering and Integration and the Army Acquisition Executive on COE matters, provide assessments and reports, and prepares information to support Decision-making. Synchronize analysis, planning information and presentations to inform the Strategic Portfolio Analysis Review (SPAR).</p> <p>Title: Cyber</p> <p>Description: Cyber Security engineering, architecture and development tasks necessary to create effective, affordable and secure network capabilities that address critical gaps, meet Mission Command Network (MCN) 2020 objectives and/or Force 2025 and Beyond (F2025B) initiatives. This effort includes analysis of integrated capabilities, requirements decomposition and alignment, and resource and acquisition synchronization.</p> <p>FY 2016 Accomplishments: These funds provided for the following:</p> <ul style="list-style-type: none"> - Cyber Programs: Supported Cyber materiel development processes by continually researching innovative acquisition process as well as utilizing science and technology resources to take advantage of the available technology. Streamlined and rapid Cyber materiel development processes support the Army Cyber mission forces as well as Army life-cycled managed systems and networks against emerging/evolving Cyber threats. - Mission Assurance and Compliance: Continued to improve the vulnerability management system, ensuring standardized compliance processes that provide flexibility to Program Managers and Commanders, allowing them to make decisions based on the vulnerability, risk and operational importance of the system or network; this provides Army Mission Assurance and Compliance processes and methodologies that are tailored to the system, network, and operations. - CIO Governance: Continued to manage the acquisition domain portfolio and business systems for ASA(ALT). Provided acquisition domain strategy, system binning requests, system assertions, system compliance reviews, problem statement 		2.678	2.086	3.256

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>review, CIO policy, system architecture, E2E process, policy and governance, data center consolidation, data management, CIO operations management, policy and governance and integration of Cyber and CIO resources.</p> <p>- Cyber security: Assisted in the improvement of the system and network accreditation processes for life-cycle managed systems, that streamlined the processes for quicker accreditation; this allowed systems and networks to move through the development, testing and fielding processes, supporting rapid fielding of cyber capabilities and resilient systems to Warfighters.</p> <p>- Cyber Architecture: Provided cyber architecture subject matter expertise and cross PEO architecture integration, including systems engineering analysis and requirements decomposition of cyber requirements, and product support for Capability Set Fielding and Engineering and Integration architecture efforts.</p> <p>FY 2017 Plans: These funds support critical ASA(ALT) Cyber Focal SMEs for synchronization, analysis and integration of Cyber functions and products.</p> <p>- Cyber Programs: Provide oversight, synchronize and coordinate requirement development, decomposition and validation efforts for Requirements Definition Packages and Capability Drops based on validated Information Systems (IS) capability documents in support of efforts to provide cutting edge cyber capability to the warfighter. Oversee, synchronize and coordinate fielding of cyber capabilities utilizing the Cyber Acquisition Task Force. These capabilities include defensive cyberspace operation, situational awareness and department of defensive information network Socialize efforts with the Cyber stakeholders and key leadership. Manage the synchronization between program offices, HQDA, and the Army Cyber Command regarding efforts for the drafting, validation and execution of operational needs statements, office of primary responsibility, materiel development decisions. Co-chair the Cyber Acquisition, Requirements, and Resourcing Operational Planning Team. The CARR is responsible for recommending prioritization of validated Cyberspace requirements in view of operational imperatives, estimated costs, and available resources; approving an annual plan for cyberspace capability development that assists materiel and capability developers in forecasting resourcing requirements; measuring progress from the prior year's annual plan, in order to align future requirements and inform stakeholders of the accomplishments in attaining Cyberspace capabilities in meeting the above objectives; evaluating and providing recommendations on priorities for cyber-related special program requirements to ensure deconfliction, cross-functional review, and integration of special program issues, with sufficient participation of stakeholders. Develop integrated cyber acquisition strategies across multiple PoRs and Program Executive Offices. Participates in the Army Cyberspace Council; maintain the Army's Cyber Acquisition strategy/plan to reflect changes in technology and policy/regulation and to address emerging cyber requirements. Continue to execute cyber innovation challenges by hosting meetings, conferences, conducting market research, working with the Army Contracting Command, Program Executive Office and the Army</p>				

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Cyber Command. Expand market research to include academia, Industry, International organizations, and specified cooperative security efforts in order to identify and utilize common cyber efforts.</p> <p>- Mission Assurance and Compliance: Conduct initial full baseline scoring of ASAALT systems using the existing criteria in the Operational Risk Decision Framework. Further refine the criteria for future scoring based on Army Cyber Command criteria weighting and available system documentation. Participated in the existing Insider Threat IPT Lines of Effort (LOE) to mitigate the risk of insider threat, ensure cross PEO equities and resourcing requirements were identified to implement the findings in the IPT. Continue to improve the vulnerability management system by participating in the PEO C3T and NETCOM vulnerability management pilot and develop the plan for follow on activities to implement the lessons learned and Tactics, Techniques and Procedures across the ASAALT portfolio. Conduct cyber assessments using the Mission Assurance and Compliance processes and methodologies tailored to the system, network, and operations to ensure cyber is a part of the overall systems engineering assessments of Programs of Record. Continue to provide HQ staff support to the PEO Information Assurance Program Managers in the area of Command Cyber Readiness Inspections, Tactical Public Key Infrastructure, and Cyber Tool Implementation. Support to Other SoSE&I Directorates: Conduct requirements identification, decomposition, and engineering support to integrate cyber into the Common Operating Environment, including the development of the Tactical PKI Cross Cutting Capability, input to Implementation plans, integrated systems engineering plans, and integrated architecture. Conduct requirements identification, decomposition, and engineering support to develop a holistic approach to identity and access management and Public Key Infrastructure. Efforts include a Tactical PKI Exception Memorandum, Assessment of Tactical and Strategic PKI and IdAM based authentication, Enterprise Directory Services (EDS), and Enterprise Tactical Identity and Email Service (ETIES). Continue to develop the software vulnerability architecture to provide a system of system analysis tool to determine high risk systems to cyber vulnerabilities based on access to enterprise capabilities and location on the actual tactical network. Effort also includes the development of the FY 16 assessment plan for mission assurance analysis to be conducted through SOSEI Engineering and Analysis Risk Reduction yearly analysis plan.</p> <p>- Cyber Security: Lead ASA(ALT) Cybersecurity Program; accredit, validate, and oversee ASA(ALT) systems cybersecurity activities and manage cybersecurity workforce. Continue providing support to PEO Information Assurance Program Managers regarding cybersecurity including risk management framework, eMASS, MS4X and ISSP, FISMA compliance, and ACAS. Provide cybersecurity oversight for PM PNT, USAASC, and DASA-P information systems through consultation, policies, and Authorizing Official (AO) authority. Conduct Risk Management Framework (RMF) assess only activities for SoSE&I owned and sponsored systems, lead RMF tactical overlay development.</p>				

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Coordinate and assist with red and blue team efforts for ASA(ALT) portfolio, providing support to Mission Assurance/Resilience in their assessment activities, identifying vulnerabilities in ASA(ALT) information systems throughout the acquisition lifecycle. Perform cybersecurity engineering analysis support for SoSE&I owned and sponsored information systems, including architecture reviews to identify potential vulnerabilities and risk mitigation techniques. Support Cyber Collective Training initiative led by PEO STRI.</p> <p>- Support Engineering and Integration: Lead the Lab Based Risk Reduction cybersecurity effort, coordinating blue team activities for LBRR, transitioning lessons learned from the lab into the field environment. Conduct compliance scans in preparation for the blue team assessment, identifying potential vulnerabilities and ensuring information system owners remediate or mitigate issues. Continue supporting NIE/AWA Strategic Planning Reviews (SPRs) and Bullpens as the TRIAD lead for cybersecurity for both efforts. Conduct architecture reviews and golden vehicle checkout, identifying potential vulnerabilities and risk mitigation techniques. Interface with appropriate agencies for certification issues and cross domain solutions support.</p> <p>- Engineering Support to the Cyber Focal teams and related Cyber engineering tasks where a Cyber Subject Matter Expert (SME) is required or valuable: These funds provide for Cyber SME support to Cyber Programs to decompose in coming requirements documents for the purpose of gap identification, redundant capability definition or requirement between multiple requirements documents, requirement definition in support of resourcing said requirement(s). Cyber SME assistance to Cybersecurity/Cyber Focal with red and blue team efforts for ASA(ALT) portfolio. Cyber SME support to Mission Assurance/Resilience with software vulnerability/protection architecture support and coordination between Cyber Mission Assurance / Resilience and E&I Architecture team. Support with the way forward for Public Key Infrastructure (PKI) and Identity and Access Management (IdAM). Provides support to other Directorates: Support to CIO Governance to integrate Army Acquisition Business Enterprise Architectures (ABBEA) and the Army-Business Enterprise Architecture (A-BEA), Engineering and Integration Team: support to E&I to include Focused End State mission essential and mission enhancing capabilities requirements language (along with G-3/5/7) and support to NIE 17.2 and red/blue teaming and Strategic Planning Reviews (SPRs).</p> <p>- Resourcing and Budget: Coordinate resourcing requirements for emerging threats, defensive/offensive cyberspace operation requirements, and mission assurance and compliance requirements with program offices, develop consolidated Army Cyber picture for iWSR/LIRS/POM, present resourcing requirements at WSR reviews. Develop responses to congressional inquiries. Manage and coordinate Cyber BRP efforts. These resourcing activities are imperative to ensure cyber capabilities are provided to the war fighter and Army systems are defendable against cyber threats.</p>				

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
<p>- Effort to develop and maintain Cyber specific IMS These funds provide for SMEs to develop and maintain an Integrated Master Schedules for SoSE&I's Cyber efforts. Close out the IMS for FY16, maintain the IMSs for FY17 and develop initial IMSs for FY18 and FY19. In support of Cyber efforts collect and analyze sub-schedule performance against the baseline Integrated Master Schedule to identify schedule risks. Validate that established integration points are achievable and, if not, identify the schedule risk. Analyze schedule performance against schedule baseline, identify variances and their causes, and identify risks and/or impacts to critical path. Perform "what if" schedule analysis of alternative program courses of action to determine impact on schedule critical path. Update and post Schedules on SharePoint for visibility and increased collaboration across ASA(ALT). Participate in Cyber working groups. Provide scheduling reports and briefings to meet the needs of the Cyber communities. This includes: Cyber IMS and briefings and reports from IMS analysis.</p> <p>FY 2018 Plans: These funds support critical Cyber SMEs for synchronization, analysis and integration of Cyber functions and products. Cyber Programs:</p> <ul style="list-style-type: none"> - Provide oversight, governance, synchronize and coordinate across the Army for cyberspace operations requirements and capabilities. - Manage the synchronization of multiple efforts between program offices, HQDA, and the Army Cyber Command regarding efforts for the drafting, validation and execution of operational needs statements, appointing an office of primary responsibility, materiel development decisions and other required programmatic support. - Participate in the prioritization of Cyberspace requirements in view of operational imperatives, estimated costs, and available resources; approving an annual plan for cyberspace capability development that assists materiel and capability developers in forecasting resourcing requirements; measuring progress from the prior year's annual plan and forecasting future requirements. - Maintain the Army's Cyber Acquisition strategy/plan to reflect changes in technology and policy/regulation and to address emerging cyber requirements. - Continue to execute cyber innovation challenges by hosting meetings, conferences, conducting market research, working with the Army Contracting Command, PEO and the Army Cyber Command (ARCYBER) and other efforts. - Expand market research to include academia, Industry, International organizations, and specified cooperative security efforts in order to identify and utilize common cyber efforts. <p>Cyber engineering tasks:</p> <ul style="list-style-type: none"> - Decompose incoming requirements documents for the purpose of gap identification, redundant capability definition or requirement between multiple requirements documents, requirement definition in support of resourcing requirement(s). 			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<ul style="list-style-type: none"> - Assist in identifying possible vulnerabilities in current weapon systems and analyzing current requirement solutions' concept of operations. - Identify potential commercial industry solutions and techniques used to protect from known and unknown cyber threats. - Analyze what the Army science and technology experts are highlighting as key research areas as it relates to defensive and offensive cyber operations. - Decompose the cyberspace operation requirements to break out the defined Key Performance Parameters and Key System Attributes into clearly defined capabilities, measures of performance and effectiveness, and risks. <p>Cyber Resource Synchronization:</p> <ul style="list-style-type: none"> - Provide guidance and synchronization of ASA(ALT) PEOs and PMs to Army leadership guidance for cyber resourcing and budget efforts. Serve as liaison to ARCYBER, HQDA, and acquisition community with regards to cyber funding. - Prepare reclamation and attend Congressional hearing appeals for cyberspace operations funding marks. - Provide lead coordination and synchronization across ARCYBER, HQDA, and acquisition community for cyclical Planning, Programing, and Budget Execution events. - Lead coordination and synchronization across acquisition community and HQDA for Budget Estimate Submissions and President's Budget P&R Form submissions. - Consolidate and review cost estimates for cyber PoRs/non-PoRs. - Analyze applicable regulations, policy statements, and program guidelines that impact cyber programs. - Provide data, economic, and cost analyses to develop estimates to support program requirements such as program milestones and required DA and OSD reporting. 				
<p>Title: Facilities and IT Support</p> <p>Description: Provides funding for infrastructure/facilities and IT support.</p> <p>FY 2016 Accomplishments: Provided funding for infrastructure/facilities. It included the cost for government IT support from Network connectivity to purchasing/leasing hardware, software, computers, communications equipment and services.</p> <p>FY 2017 Plans: Provides funding for infrastructure/facilities. It includes the cost for government IT support from Network connectivity to purchasing/leasing hardware, software, computers, communications equipment and services.</p> <p>FY 2018 Plans:</p>		0.971	0.533	0.582

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
Provides funding for infrastructure/facilities. It includes the costs for purchasing/leasing hardware, software, computers, communications equipment and services.			
Accomplishments/Planned Programs Subtotals	15.802	14.166	15.508

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
• DY3: <i>NIE Test & Evaluation</i>	10.768	65.844	58.395	-	58.395	61.482	49.699	45.735	50.051	Continuing	Continuing
• DY4: <i>Network Integration Support</i>	13.700	-	-	-	-	-	-	-	-	0.000	13.700
• DY5: <i>Production/Field Coordination for Capability Sets</i>	3.486	3.960	4.261	-	4.261	4.349	4.434	4.524	4.502	Continuing	Continuing
• DY6: <i>Brigade and Platform Integration Support</i>	44.164	-	-	-	-	-	-	-	-	0.000	44.164
• DZ6: <i>Army Integration Management & Coordination</i>	8.366	5.746	6.775	-	6.775	6.922	7.065	7.217	7.367	Continuing	Continuing
• FG7: <i>Emerging Technology Initiatives</i>	-	56.939	60.421	-	60.421	39.991	39.985	35.995	41.020	Continuing	Continuing

Remarks

D. Acquisition Strategy

This project does not have any requirement for direct procurement of hardware or software.

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 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY7 / <i>Army Systems Engineering, Architecture & Analysis</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			
Army System of System Engineering and Analysis	TBD	TBD : Various	22.378	9.196	Nov 2015	8.393	Nov 2016	-		-		-	0.000	39.967	0.000
Common Operating Environment (COE)	TBD	TBD : Various	6.858	2.957	Nov 2015	3.154	Nov 2016	-		-		-	0.000	12.969	0.000
Cyber	TBD	TBD : Various	0.000	2.678	Nov 2015	2.086	Nov 2016	-		-		-	0.000	4.764	0.000
Army System of System Engineering and Analysis Core Labor	Allot	SoSE&I : Various	0.000	-		-		4.479		-		4.479	Continuing	Continuing	0.000
Army System of System Engineering and Analysis Matrix Labor	MIPR	CERDEC : Various	0.000	-		-		0.982		-		0.982	Continuing	Continuing	0.000
Army System of System Engineering and Analysis SETA Labor	C/CPFF	TBD : Various	0.000	-		-		1.091		-		1.091	Continuing	Continuing	0.000
Army System of System Engineering and Analysis FFRDC Labor	FFRDC	MITRE : Various	0.000	-		-		3.956		-		3.956	Continuing	Continuing	0.000
Common Operating Environment (COE) Core Labor	Allot	SoSE&I : Various	0.000	-		-		1.161		-		1.161	Continuing	Continuing	0.000
Cyber Core Labor	Allot	SoSE&I : Various	0.000	-		-		2.076		-		2.076	Continuing	Continuing	0.000
Cyber Matrix Labor	MIPR	CERDEC : Various	0.000	-		-		0.300		-		0.300	Continuing	Continuing	0.000
Cyber SETA Labor	C/CPFF	TBD : Various	0.000	-		-		0.248		-		0.248	Continuing	Continuing	0.000
Cyber FFRDC Labor	FFRDC	MITRE : Various	0.000	-		-		0.633		-		0.633	Continuing	Continuing	0.000
Subtotal			29.236	14.831		13.633		14.926		-		14.926	-	-	0.000

Remarks
 Note: 1
 - Program Activities performed at Aberdeen Proving Ground (MD), Taylor Bldg, (Crystal City, VA), Pentagon, (Washington DC), TACOM (Warren, MI)

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

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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			
Facility and IT Support	TBD	Various: Note: 1 : TBD	2.416	0.971	Nov 2015	0.533	Nov 2016	0.582	Nov 2017	-		0.582	0.000	4.502	0.000
Subtotal			2.416	0.971		0.533		0.582		-		0.582	0.000	4.502	0.000

Remarks
 Note:1
 - Program Activities performed at Aberdeen Proving Ground (MD), Taylor Bldg, (Crystal City, VA), Pentagon, (Washington DC), TACOM (Warren, MI)

	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	31.652	15.802	14.166	15.508	-	15.508	-	-	0.000

Remarks

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

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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
Develop and deliver Tech Eval Criteria, Refined GAPs and Scope of Work	█																											
CS19 NIE Golden Vehicle Safety Releases		██████████																										
Develop and deliver Capability Set Modernization Matrix for CS2020 & C		██████████																										
Develop and deliver effective emulator and integration tools		██████████																										
Develop and deliver engineering-level formation/SoS, platform, COE and		██████████																										
Review, update and deliver the Common Operating Environment (COE) A		██████																										
Develop and deliver CS roadmaps, integral to ASA(ALT) IMS data		██████																										
Develop and deliver Capabilities Definition, Implementation Plan Updates			██████																									
CS20 Preliminary Reference IBOI								██████																				
CS18 CS TDP (A/B Kit Design)								██████																				
CS19 Unit NBOI (NRE Baseline)								██████████																				
CS19 Golden Vehicle / NRE List								██████████																				
CS21 Unit NBOI (NRE Baseline) [ABCT/SBCT]								█																				

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY7 / <i>Army Systems Engineering, Architecture & Analysis</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
CS19 Platform Network Diagrams					■																							
CS19 Final Reference IBOI					■																							
CS19 Vulnerabilities Assessment Report					■																							
CS19 Technical Data Packages					■																							
CS19 Unit NBOI (Procurement Baseline)					■																							
CS19 Final Reference Transport Design					■																							
CS19 Final CS Core Threads					■																							
CS19 Final Reference Transport Overlay					■																							
CS19 Final Reference VIDs/PIDs					■																							
CS19 LBRR Systems Assessment Report					■																							
CS19 NIE VALEX Task List					■																							
CS18 CS Golden Vehicle Safety Releases / Confirmations					■				■																			
CS19 Unit SoS View (aka Transport Design)					■				■																			

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY7 / <i>Army Systems Engineering, Architecture & Analysis</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				
CS19 Unit VIDs																																
CS18 Preliminary Integrated Platforms Delivery Schedule																																
CS19 NIE Consolidated Evaluation Reports																																
CS18 Final Integrated Platforms Delivery Schedule																																
CS19 DP3 Implementation Plan																																
CS19 Non-Recurring Engineering																																
CS18 CS NetVer / INV2 Report																																
CS19 CS TDP (A/B Kit Design)																																
CS20 Preliminary Reference Transport Design																																
CS20 Interim CS Modernization Matrix (Consolidated Roadmap)																																
CS20 Preliminary CS Core Threads																																
CS20 Preliminary Reference VIDs/PIDs																																
CS20 Interim Reference IBOI																																

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY7 / <i>Army Systems Engineering, Architecture & Analysis</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
CS20 Preliminary Reference Transport Overlay					■																							
CS20 Preliminary Network Analysis Requirements (Arch / COE / Cyber)					■																							
CS20 NIE Solicitations					■																							
CS20 COE v2 Capability List					■																							
CS20 Interim Reference Transport Overlay					■																							
CS20 Interim Reference Transport Design					■																							
CS20 Alternate Venues Availability Report					■																							
CS20 Interim CS Core Threads					■																							
CS20 Interim Reference VIDs/PIDs					■																							
CS20 Receive AIC Certification Architecture Products					■																							
CS20 CS Lab Knowledge Transfer Report Complete					■																							
CS20 Final Architecture Design Network Analysis Document					■																							
CS21 Preliminary CS Modernization Matrix (Consolidated Roadmap)					■																							

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY7 / <i>Army Systems Engineering, Architecture & Analysis</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
CS21 Golden Vehicle / NRE List [ABCT/SBCT]																												
CS20 DP2 Systems List																												
CS20 Final COE / Cyber Feeder Data																												
CS21 Preliminary Reference IBOI [IBCT]																												
CS20 Final CS Modernization Matrix (Consolidated Roadmap)-CS20																												
CS21 Hardware Delivery Memorandum																												
CS20 NIE Evaluation Architecture - Transport Design																												
CS20 Unit NBOI (NRE Baseline) IBCT																												
CS20 Golden Vehicle / NRE List																												
CS19 Procurement																												
CS19 LTI Integration																												
CS19 Receive Kits (Production)																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY7 / <i>Army Systems Engineering, Architecture & Analysis</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Develop and deliver Tech Eval Criteria, Refined GAPs and Scope of Work for NIE16	4	2014	1	2016
CS19 NIE Golden Vehicle Safety Releases	2	2015	2	2017
Develop and deliver Capability Set Modernization Matrix for CS2020 & CS2025	4	2015	3	2016
Develop and deliver effective emulator and integration tools	4	2015	4	2016
Develop and deliver engineering-level formation/SoS, platform, COE and Cyber arc	1	2016	4	2016
Review, update and deliver the Common Operating Environment (COE) Assessment Cri	1	2016	2	2016
Develop and deliver CS roadmaps, integral to ASA(ALT) IMS data	2	2016	3	2016
Develop and deliver Capabilities Definition, Implementation Plan Updates,	3	2016	4	2016
CS20 Preliminary Reference IBOI	4	2016	2	2017
CS18 CS TDP (A/B Kit Design)	1	2017	2	2017
CS19 Unit NBOI (NRE Baseline)	1	2017	3	2017
CS19 Golden Vehicle / NRE List	1	2017	3	2017
CS21 Unit NBOI (NRE Baseline) [ABCT/SBCT]	1	2017	1	2017
CS19 Platform Network Diagrams	2	2017	2	2017
CS19 Final Reference IBOI	2	2017	2	2017
CS19 Vulnerabilities Assessment Report	2	2017	3	2017
CS19 Technical Data Packages	2	2017	2	2017
CS19 Unit NBOI (Procurement Baseline)	2	2017	4	2017
CS19 Final Reference Transport Design	3	2017	3	2017
CS19 Final CS Core Threads	3	2017	3	2017
CS19 Final Reference Transport Overlay	3	2017	3	2017
CS19 Final Reference VIDs/PIDs	3	2017	3	2017

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY7 / <i>Army Systems Engineering, Architecture & Analysis</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
CS19 LBRR Systems Assessment Report	3	2017	3	2017
CS19 NIE VALEX Task List	3	2017	3	2017
CS18 CS Golden Vehicle Safety Releases / Confirmations	3	2017	4	2017
CS19 Unit SoS View (aka Transport Design)	3	2017	3	2017
CS19 Unit VIDs	3	2017	4	2017
CS18 Preliminary Integrated Platforms Delivery Schedule	3	2017	3	2017
CS19 NIE Consolidated Evaluation Reports	4	2017	4	2017
CS18 Final Integrated Platforms Delivery Schedule	4	2017	4	2017
CS19 DP3 Implementation Plan	4	2017	4	2017
CS19 Non-Recurring Engineering	4	2017	1	2018
CS18 CS NetVer / INV2 Report	1	2018	1	2018
CS19 CS TDP (A/B Kit Design)	1	2018	2	2018
CS20 Preliminary Reference Transport Design	2	2017	2	2017
CS20 Interim CS Modernization Matrix (Consolidated Roadmap)	2	2017	2	2017
CS20 Preliminary CS Core Threads	2	2017	2	2017
CS20 Preliminary Reference VIDs/PIDs	2	2017	2	2017
CS20 Interim Reference IBOI	2	2017	3	2017
CS20 Preliminary Reference Transport Overlay	2	2017	2	2017
CS20 Preliminary Network Analysis Requirements (Arch / COE / Cyber)	2	2017	2	2017
CS20 NIE Solicitations	2	2017	2	2017
CS20 COE v2 Capability List	3	2017	3	2017
CS20 Interim Reference Transport Overlay	3	2017	3	2017
CS20 Interim Reference Transport Design	3	2017	3	2017
CS20 Alternate Venues Availability Report	3	2017	3	2017
CS20 Interim CS Core Threads	3	2017	4	2017

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DY7 / <i>Army Systems Engineering, Architecture & Analysis</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
CS20 Interim Reference VID/PIDs	3	2017	4	2017
CS20 Receive AIC Certification Architecture Products	3	2017	4	2017
CS20 CS Lab Knowledge Transfer Report Complete	3	2017	4	2017
CS20 Final Architecture Design Network Analysis Document	4	2017	4	2017
CS21 Preliminary CS Modernization Matrix (Consolidated Roadmap)	4	2017	4	2017
CS21 Golden Vehicle / NRE List [ABCT/SBCT]	4	2017	4	2018
CS20 DP2 Systems List	4	2017	4	2017
CS20 Final COE / Cyber Feeder Data	4	2017	4	2017
CS21 Preliminary Reference IBOI [IBCT]	4	2017	2	2018
CS20 Final CS Modernization Matrix (Consolidated Roadmap)-CS20	4	2017	1	2018
CS21 Hardware Delivery Memorandum	1	2018	1	2018
CS20 NIE Evaluation Architecture - Transport Design	1	2018	1	2018
CS20 Unit NBOI (NRE Baseline) IBCT	1	2018	3	2018
CS20 Golden Vehicle / NRE List	1	2018	4	2018
CS19 Procurement	3	2018	4	2018
CS19 LTI Integration	4	2018	1	2019
CS19 Receive Kits (Production)	4	2018	2	2019

Note

KEY:

Armored Brigade Combat Team (ABCT) / Infantry Brigade Combat Team (IBCT) / Stryker Brigade Combat Team (SBCT)
 Basis of Issue (BOI) / Platform Interconnect Diagram (PID) / Transport Design (TD) / Data Flow Diagram (DFD)
 Network Design Book (NDB) / Vehicle Integration Design (VID) / Non-Recurring Engineering (NRE) / Lower Tactical Internet (LTI)

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>				Project (Number/Name) DZ6 / <i>Army Integration Management & Coordination</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
DZ6: <i>Army Integration Management & Coordination</i>	-	8.366	5.746	6.775	-	6.775	6.922	7.065	7.217	7.367	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds the "shared" resources that support the technical and management (i.e. headquarters, resource management, acquisition, human resources, and operations) aspects of the Army's Integrated Evaluations, System of Systems Engineering and Analysis efforts, coordination of Capability Set (CS) Fieldings, and the Army Rapid Capabilities Office (RCO). Effectively utilizing "shared" resources reduces overall cost to the program. The personnel funded by this project provide staff functions for the Brigade Analysis, Integration and Evaluation program missions and the RCO.

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

	FY 2016	FY 2017	FY 2018
Title: Program Management and Integration	7.304	5.138	6.062
Description: This effort funds for all "shared" resources that supports the Brigade Analysis, Integration and Evaluation program and the Army Rapid Capabilities Office (RCO).			
FY 2016 Accomplishments: Program, information, security, business, and personnel management effort required to support the ASA(ALT) System of System Engineering and Integration (SoSE&I) Directorate. This includes; support of the system of system engineering process, the ASS(ALT) integrated master schedule development and implementation, support of the Lab Based Risk Reduction and network integration effort, support of the NIE/AWA, and support of synchronized fielding. It included the following types of activities: Program management, contracting, financial management, cost analysis, personnel management, operations, security management, information management, facilities/infrastructure management, Pentagon liaison, and knowledge management.			
FY 2017 Plans: This effort includes program, information, security, business, and personnel management efforts required to support the ASA(ALT) System of System Engineering and Integration (SoSE&I) Directorate. This includes; support of the system of system engineering process, the ASSALT integrated master schedule development and implementation, support of the Lab Based Risk Reduction and network integration effort, in support of closing-out AWA 17.1, planning, conducting/executing and closing-out NIE17.2, planning and conducting/executing AWA18.1 and planning for NIE18.2, along with closing out Capability Set Synchronized Fielding (CS) CS16, conducting CS17 and planning for CS18, it also includes support to Common Operating Environment (COE), Cyber Focal along with Positioning Navigation and Timing (PNT). It includes the following types of activities: Program			

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DZ6 / <i>Army Integration Management & Coordination</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018
management, contracting, financial management, cost analysis, personnel management, operations, security management, information management, facilities and infrastructure management, Pentagon liaison, knowledge management. FY 2018 Plans: This effort includes program, business, operations, and personnel management support. It includes the following types of activities: Program management, contracting, financial management, cost analysis, personnel management, operations, security management, information management, facilities and infrastructure management, Pentagon liaison, and knowledge management. It also includes program oversight for Program Manager, Position, Navigation, and Timing (PNT).			
Title: Facilities and IT Support Description: Provides funding for infrastructure/facilities and IT support. FY 2016 Accomplishments: Provided funding for infrastructure / facilities, and government personnel IT support from Network connectivity to purchasing/leasing hardware, software, computers, communications equipment and services. FY 2017 Plans: Provides funding for infrastructure / facilities, and government personnel IT support from Network connectivity to purchasing/leasing hardware, software, computers, communications equipment and services. FY 2018 Plans: Provides funding for infrastructure / facilities, and IT support from Network connectivity to purchasing/leasing hardware, software, computers, communications equipment and services.	1.062	0.608	0.713
Accomplishments/Planned Programs Subtotals	8.366	5.746	6.775

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>
• DY3: <i>NIE Test & Evaluation</i>	10.768	65.844	58.395	-	58.395	61.482	49.699	45.735	50.051	Continuing	Continuing
• DY4: <i>Network Integration Support</i>	13.700	-	-	-	-	-	-	-	-	0.000	13.700
• DY5: <i>Production/Field</i>	3.486	3.960	4.261	-	4.261	4.349	4.434	4.524	4.502	Continuing	Continuing
<i>Coordination for Capability Sets</i>											
• DY6: <i>Brigade and Platform Integration Support</i>	44.164	-	-	-	-	-	-	-	-	0.000	44.164

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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 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) DZ6 / <i>Army Integration Management & Coordination</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>
• DY7: <i>Army Systems Engineering, Architecture & Analysis</i>	15.802	14.166	15.508	-	15.508	15.998	25.121	25.499	26.214	Continuing	Continuing
• FG7: <i>Emerging Technology Initiatives</i>	-	56.939	60.421	-	60.421	39.991	39.985	35.995	41.020	Continuing	Continuing

Remarks

D. Acquisition Strategy

This project includes the purchase of IT hardware, software and service support; general office and operational supplies.

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 / 5					R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>					Project (Number/Name) FG7 / <i>Emerging Technology 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	
FG7: <i>Emerging Technology Initiatives</i>	-	0.000	56.939	60.421	-	60.421	39.991	39.985	35.995	41.020	Continuing	Continuing	
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-			

Note

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

*Project FG7 Emerging Technology Initiatives was created in support of the Army Rapid Capabilities Office (RCO). This project will be realigned to PE 0605054A Emerging Technologies Initiatives in FY 2019 for greater transparency of the Army RCO efforts.

A. Mission Description and Budget Item Justification

This Project funds the prototyping and demonstration of selected technology enabled capabilities to support advanced Soldier, ground, aviation, and Command, Control, Communications, Computers Intelligence & Reconnaissance (C4ISR) systems and equipment.

The Primary goal is to take technologies to Technology Readiness Level (TRL) 7 and 8 through a collaborative and accelerated acquisition process. Technologies will be demonstrated in relevant environments, performing tactical/operational scenarios. Efforts will focus on high-priority, threat-based projects with the intent to deliver an operationally effective capability within one to five years. Efforts will include accelerated material development and competitive prototyping based on anticipated and emerging threats and opportunities. This Project provides the Army an improved mechanism to effectively confront emerging threats and advance America's military dominance. Efforts include development, acquisition, assessment, maturation, and transition of prototype technologies to acquisition programs in Cyber; Electronic Warfare (EW); Positioning, Navigation and Timing (PNT); Survivability and other high priority emerging threats and opportunities. Funds may also allow for acceleration of critical Program of Record capabilities to counter urgent and emerging threats. The Army Rapid Capabilities Office (RCO) assesses the provided capabilities to improve future solutions, to inform future Army capability requirements, and to potentially transition the capability to an Army acquisition program.

The Army RCO expedites the provisioning and fielding of critical combat materiel capabilities to the Warfighter to meet Combatant Commanders' needs. The Army RCO was established per Headquarters, Department of the Army, memo, SUBJECT: Establishment of the Army Rapid Capabilities Office, signed by the Secretary of the Army: Eric K. Fanning, dated 11 August 2016.

The RCO assesses Commercial-Off-The Shelf (COTS), Government Off-The- Shelf (GOTS), and Non-Developmental Item (NDI) (non-standard equipment) solutions for modification and/or integration to address changes in contested environments with enduring materiel solutions for forces deployed globally. Procure prototypes and evaluate solutions to be fielded and transition to an acquisition program for production and sustainment.

The RCO capabilities focus areas are:

- Cyber
- Electronic Warfare (EW)
- Position, Navigation and Timing (PNT)
- Survivability

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) FG7 / <i>Emerging Technology Initiatives</i>		
Operational Needs Statements (ONS) Any other operational needs that become a priority as designated by the Army Board of Directors (BOD)				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2016	FY 2017	FY 2018
<p>Title: Maturation, Prototyping, Assessment, and Integration of Emerging and Essential Technologies</p> <p>Description: This effort selects technologies that show high promise for advancing and accelerating capabilities required under acquisition programs and develops and evaluates associated prototypes for accelerated identification, assessment, and transition to an acquisition program for production and fielding. It also demonstrates integrated technologies within a high fidelity and realistic operating environment and transitions them to a formal program of record on an accelerated basis. This effort also includes analysis, integration and evaluation of emerging capabilities on air and ground platforms to reduce risk and support technology insertions.</p> <p>FY 2017 Plans: These funds will be used to identify, develop, procure, modify, and evaluate prototypes providing capability prioritized by the Board of Directors (BOD) in the areas of Cyber, EW, PNT, Survivability, and Other critical capability gaps. Funding supports infrastructure, procurement of prototypes, engineering and material for integration, field support representation, early acquisition documentation, system modification, and development and operational testing needed to transition a procurement ready solution to an acquisition program for execution.</p> <p>Electronic Warfare Phase 1 Requirements (In support of USAREUR ONS – 16-21509) - will integrate and assess Ground EW capability with enhanced and networked Electronic Warfare Planning and Management Tool (EWPMT) Thick Client, Prophet, and Versatile Radio Observation & Direction Finding (VROD) / Modular Adaptive Transmitter (VMAX). In addition, the FY17 requirement will demonstrate EW modules for Integrated Sensor Architecture (ISA).</p> <p>Electronic Warfare Phase 2 Requirements (In support of USAREUR ONS – 16-21509) - will initiate integration and assessment of air EW capability. Funding will acquire long lead prototypes, conduct non-recurring integration engineering and risk reduction exercises, and enable further development of ground EW prototype capabilities.</p> <p>Positioning, Navigation and Timing Phase 1 Requirements (In support of USAREUR ONS – 16-21509) - will integrate and assess the DAGR Distributed Device Enhancement (D3E) w/Anti-Jam (AJ) Antenna and Global Navigation Satellite System (GNSS) Sensors to participate in the Joint Warfighting Assessment (JWA) 18.1. Non-recurring engineering and integration of the D3E/AJ onto the Bradley, Abrams, Stryker and Paladin platforms is required in FY18 to obtain a Capabilities and Limitations (C&L) report to enable Urgent Materiel Release (UMR).</p> <p>FY 2018 Plans:</p>		-	56.939	60.421

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) FG7 / <i>Emerging Technology Initiatives</i>

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

	FY 2016	FY 2017	FY 2018
These funds will be used to identify, develop, procure, modify, and evaluate prototypes providing capability prioritized by the Board of Directors (BOD) in the areas of Cyber, EW, PNT, Survivability, and Other critical capability gaps. Funding supports infrastructure, procurement of prototypes, engineering and material for integration, field support representation, early acquisition documentation, system modification, and development and operational testing needed to transition a procurement ready solution to an acquisition program for execution.			
Electronic Warfare Phase 1 Requirements (In support of USAREUR ONS – 16-21509) - will continue integration and assessment that began in FY17 for Ground EW capability with enhanced and networked for Prophet, Versatile Radio Observation & Direction Finding (VROD) / Modular Adaptive Transmitter (VMAX) and Sabre Junction.			
Electronic Warfare Phase 2 Requirements (In support of USAREUR ONS – 16-21509) - will continue integration and assessment that began in FY17 of air EW capability. Funding will acquire long lead prototypes, conduct non-recurring integration engineering and risk reduction exercises, and enable further development of ground EW prototype capabilities.			
Positioning, Navigation and Timing Phase 1 Requirements (In support of USAREUR ONS – 16-21509) - will continue integration and assessment of the DAGR Distributed Device Enhancement (D3E) w/Anti-Jam (AJ) Antenna and Global Navigation Satellite System (GNSS) Sensors to participate in the Joint Warfighting Assessment (JWA) 18.1. Non-recurring engineering and integration of the D3E/AJ onto the Bradley, Abrams, Stryker and Paladin platforms is required in FY18 to obtain a Capabilities and Limitations (C&L) report to enable Urgent Materiel Release (UMR).			
Accomplishments/Planned Programs Subtotals	-	56.939	60.421

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
• DY3: <i>NIE Test & Evaluation</i>	10.768	65.844	58.395	-	58.395	61.482	49.699	45.735	50.051	Continuing	Continuing
• DY4: <i>Network Integration Support</i>	13.700	-	-	-	-	-	-	-	-	0.000	13.700
• DY5: <i>Production/Field</i>	3.486	3.960	4.261	-	4.261	4.349	4.434	4.524	4.502	Continuing	Continuing
<i>Coordination for Capability Sets</i>											
• DY6: <i>Brigade and Platform Integration Support</i>	44.164	-	-	-	-	-	-	-	-	0.000	44.164
• DY7: <i>Army Systems Engineering, Architecture & Analysis</i>	15.802	14.166	15.508	-	15.508	15.998	25.121	25.499	26.214	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 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) FG7 / <i>Emerging Technology Initiatives</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>
• DZ6: <i>Army Integration Management & Coordination</i>	8.366	5.746	6.775	-	6.775	6.922	7.065	7.217	7.367	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Army RCO capitalizes on current and emerging technologies to provide rapid solutions to address emerging threats and high impact capability opportunities of U.S. Army Forces deployed globally. This is accomplished in one of two ways: 1) adapting COTS/GOTS/NDI equipment to meet operational needs and 2) developing emerging deployable capability through research and development organizations, academia, and industry. The RCO uses streamlined acquisition methods, processes and techniques to rapidly acquire capability; these methods vary by project. The Rapid Capabilities Office will have a dedicated contracting staff, with the flexibility to use both traditional and non-traditional contracting approaches. To reach non-traditional vendors, RCO will use non-standard contracting methods, such as Other Transaction Authority instruments. Where practicable, prototypes will be acquired using competitive procedures. Projects will be transitioned to an approved acquisition program for production and sustainment. Operational assessments will be conducted to provide feedback in support of Army requirements generation, prototype maturation, and future capability development.

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 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) FG7 / <i>Emerging Technology Initiatives</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			
EW Program Management	Various	PM Electronic Warfare & Cyber : APG, MD	0.000	-		-		1.618	Jan 2018	-		1.618	0.000	1.618	0.000
PNT Program Management	Various	PM PNT : Various	0.000	-		-		1.279	Oct 2017	-		1.279	0.000	1.279	0.000
Subtotal			0.000	-		-		2.897		-		2.897	0.000	2.897	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			
Maturation, Prototyping, Assessment, and Integration of Emerging and Essential Technologies	C/TBD	TBD : TBD	0.000	-		56.939	Mar 2017	30.010		-		30.010	Continuing	Continuing	Continuing
EW VROD/VMAX Software Development	MIPR	I2WD : APG, MD	0.000	-		-		1.197	Jan 2018	-		1.197	0.000	1.197	0.000
EW Air Risk Reduction	C/CPFF	General Atomics : Multiple	0.000	-		-		7.760	Jan 2018	-		7.760	0.000	7.760	0.000
EW TORO Development	MIPR	Air Force : TBD	0.000	-		-		5.300	Dec 2017	-		5.300	0.000	5.300	0.000
EW Sabre Fury Development	C/CPFF	SRC : Syracuse, NY	0.000	-		-		2.088	Dec 2017	-		2.088	0.000	2.088	0.000
EW ISA Software Development	C/CPFF	MTEQ : APG, MD	0.000	-		-		0.914	Jan 2018	-		0.914	0.000	0.914	0.000
EW EWPMT Development	C/CPFF	Raytheon : Ft. Wayne, IN	0.000	-		-		1.977	Jan 2018	-		1.977	0.000	1.977	0.000
PNT D3E Integration	C/CPFF	GPS Source : Pueblo, CO	0.000	-		-		0.752	Jan 2018	-		0.752	0.000	0.752	0.000
Subtotal			0.000	-		56.939		49.998		-		49.998	-	-	-

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) FG7 / <i>Emerging Technology Initiatives</i>
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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			
EW VROD/VMAX Information Assurance	MIPR	I2WD : APG, MD	0.000	-		-		0.522	Jan 2017	-		0.522	0.000	0.522	0.000
EW Prophet Safety Support	MIPR	CECOM : APG, MD	0.000	-		-		0.075	Dec 2017	-		0.075	0.000	0.075	0.000
PNT Engineering Support	C/CPFF	CERDEC : APG, MD	0.000	-		-		1.178	Oct 2017	-		1.178	0.000	1.178	0.000
Subtotal			0.000	-		-		1.775		-		1.775	0.000	1.775	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			
EW Sabre Fury Software Test and Information Assurance	MIPR	TBD : TBD	0.000	-		-		0.950	Dec 2017	-		0.950	0.000	0.950	0.000
EW RIM Test Articles	C/IDIQ	Army Research Laboratory : APG, MD	0.000	-		-		2.450	Jan 2018	-		2.450	0.000	2.450	0.000
EW EWPMT Test	C/CPFF	Raytheon : Ft. Wayne, IN	0.000	-		-		0.727	Jan 2018	-		0.727	0.000	0.727	0.000
PNT Customer Test	MIPR	ATEC WSMR : WSMR, NM	0.000	-		-		0.897	Nov 2017	-		0.897	0.000	0.897	0.000
PNT Pseudolite test	MIPR	ATEC WSMR : WSMR, NM	0.000	-		-		0.217	Nov 2017	-		0.217	0.000	0.217	0.000
PNT JWA 18.1	MIPR	ATEC : OCONUS	0.000	-		-		0.510	Nov 2017	-		0.510	0.000	0.510	0.000
Subtotal			0.000	-		-		5.751		-		5.751	0.000	5.751	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	-	56.939	60.421	-	60.421	-	-	-

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) FG7 / <i>Emerging Technology 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
Technology Evaluation FY17																												
Prototype Procurement FY17																												
Technology Evaluation FY18																												
Prototype Procurement FY18																												
Technology Evaluation FY19																												
Prototype Procurement FY19																												

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604798A / <i>Brigade Analysis, Integration and Evaluation</i>	Project (Number/Name) FG7 / <i>Emerging Technology Initiatives</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Technology Evaluation FY17	2	2017	3	2018
Prototype Procurement FY17	3	2017	4	2017
Technology Evaluation FY18	1	2018	3	2018
Prototype Procurement FY18	3	2018	4	2018
Technology Evaluation FY19	1	2019	3	2019
Prototype Procurement FY19	3	2019	4	2020

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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 5: System Development & Demonstration (SDD)					PE 0604802A / Weapons and Munitions - Eng 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
Total Program Element	-	18.037	99.165	145.232	-	145.232	147.492	105.404	85.760	65.505	Continuing	Continuing
613: MORTAR SYSTEMS	-	0.000	25.148	20.115	-	20.115	32.927	25.566	10.478	8.300	Continuing	Continuing
EC1: 40mm Hi Vel and Low Vel Thermal Training Cartridge	-	6.969	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.969
EC4: Non-Standard Simulator Munitions	-	1.915	1.092	2.839	-	2.839	3.184	2.675	2.146	2.185	0.000	16.036
ED7: Advanced Multipurpose (AMP) Cartridge	-	0.000	31.215	31.655	-	31.655	28.018	0.000	0.000	0.000	0.000	90.888
EL9: Ammunitions Logistics Prototyping	-	0.000	0.106	0.686	-	0.686	0.798	0.986	1.041	3.755	0.000	7.372
EP2: Individual Assault Munition (IAM)	-	0.000	4.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.000
EP4: One-Way Luminescence for Small Caliber Ammo	-	0.000	0.000	2.688	-	2.688	5.698	6.002	11.891	6.400	Continuing	Continuing
EP5: Adv Armor-Piercing (ADVAP) for Small Caliber Ammo	-	0.000	10.270	11.571	-	11.571	12.887	1.804	7.297	7.000	Continuing	Continuing
EP6: Lightweight Cartridge Case for Small Caliber Ammo	-	0.000	1.290	0.000	-	0.000	0.000	0.000	0.000	2.000	0.000	3.290
EP7: Aviation Airborne Expandable Countermeasures	-	0.000	1.431	7.500	-	7.500	7.300	5.800	0.000	16.400	0.000	38.431
EU4: 40mm HV Improved High Explosive Dual Purpose	-	0.000	0.303	3.191	-	3.191	7.288	13.207	2.970	2.341	0.000	29.300
EU7: Enhanced Lethality Cannon Munitions	-	0.000	8.000	20.500	-	20.500	8.000	8.000	8.000	0.000	0.000	52.500
EU8: Improved Multi-Option Fuze	-	0.000	0.000	8.000	-	8.000	8.000	10.000	0.000	0.000	0.000	26.000
EW1: 40mm LV High Explosive Air Burst, XM1166	-	0.000	0.353	9.678	-	9.678	13.412	14.195	21.553	1.500	0.000	60.691

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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: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>					PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>							
FA6: <i>30mm Lethality</i>	-	0.000	0.000	12.000	-	12.000	14.000	9.000	12.000	7.000	0.000	54.000
S36: <i>Precision Guidance Kit</i>	-	9.153	15.957	14.809	-	14.809	5.980	8.169	8.384	8.624	Continuing	Continuing

Note
 In FY 2018, PE 0604802A Project EW1 40mm Low Velocity Door Breach (DB), XM1167, is a new start program. However, project EW1 40mm Low Velocity High Explosive Air Burst (HEAB) XM1166 is not a new start program.
 In FY 2018, PE 0604802A Project FA6 is a new start program.

A. Mission Description and Budget Item Justification

This program element funds multiple efforts for engineering development of weapons and munitions systems.

Project 613: The High Explosive Guided Mortar (HEGM) project funds engineering development of precision guidance systems applicable to Indirect Fire mortar weapon systems. HEGM provides a precision capability to support the close fight in urban and complex terrain, while at the same time, reducing collateral damage. HEGM provides precision accuracy and effectiveness for 120mm mortar systems using precision guidance systems that will effectively reduce target delivery error. The HEGM capability will be developed through the use of improved guidance and control components and advanced airframe design that allow sufficient maneuver of the cartridge in flight to correct for induced error providing the ability to engage targets without the need to adjust fire. FY 2018 funding will support the continuation of the Engineering and Manufacturing Development (EMD) phase; activities will include Preliminary Design Review (PDR), award of follow on developmental efforts, and initiation of detailed design phase.

The Weaponized Universal Lightweight Fire-control (WULF) project funds engineering development of fire-control systems applicable to Indirect Fire mortar weapon systems. WULF is a digital sight integrated with digital fire-control that is designed for aiming of the M252 81mm mortar system and other man portable mortar systems (60mm and 120mm). The digital sight unit and Fire Control will allow the Soldier to emplace the mortar systems faster and fire more accurately. WULF will improve the accuracy of the M252 mortar. FY 2018 funding will support the continuation of the EMD phase; activities will include Critical Design Review (CDR), engineering development, and software refinement of matured prototype to support the off Line-Replacement-Unit Environmental test and Software Development Engineering testing.

Project EC1: The Target Practice Day Night Thermal (TP-DNT) cartridges are 40mm grenade training cartridges. The Low Velocity (LV) variant is for training with the M203/M320 grenade launchers; the High Velocity (HV) variant is for training with the Mk19 grenade machine gun. Both cartridges will provide the Warfighter with a non-dud producing, environmentally friendly training cartridge that provides a visual impact signature seen day or night, by the naked eye, through night vision devices, and thermal weapon sights. These cartridges will replace the 40mm M781 LV Target Practice and the 40mm M918/M385A1 (Mixed Belt) HV Target Practice. It is expected that the unit price for high velocity cartridges will be lower than the Mixed Belt cartridges.

Project EC4: This project will standardize various pyrotechnics that simulate battlefield effects. The Army's Combat Training Centers (CTCs) are currently using non-standard munitions to replicate both conventional and asymmetric warfare battlefield effects. These modified commercial-off-the-shelf products have not been type classified, material released, and are not safe or sustainable for use by Soldiers. This effort will develop and demonstrate various pyrotechnics/simulators to replicate

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	
<p>both conventional and asymmetric warfare battlefield effects such as: Black smoke signature (burning vehicles, buildings, and equipment); Yellow smoke signature (chemical, biological or nuclear effects); Macro pyrotechnics to simulate hostile fire and small Improvised Explosive Devices (IEDs) during mounted operations in urban terrain; Micro pyrotechnics to simulate indoor hostile fire and IED effects that are capable of being integrated into existing facilities; Rocket Propelled Grenade (RPG) on a wire to replicate the flight of a Rocket Propelled Grenade; High Order Blast Effect (HOBE) used to replicate a Vehicle Borne Improvised Explosive Device (VBIED), building explosions, and other significant explosive events; Artillery airburst (LA45) simulator to replicate indirect fire; simulator to replicate a STINGER (LA47) firing; Tracer Fire-back simulator to replicate enemy small arms fire and anti-aircraft fire. Standardization will reduce training costs, eliminate redundancies between systems, mitigate environmental concerns and safety risks associated with realistic scenario based training.</p> <p>Project ED7: 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 breech 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 2018 will support continuation of the Engineering and Manufacturing Development (EMD) Phase 2 which will include safety and performance testing and the manufacturing and procurement of cartridges for the third Cartridge Integration Test. FY 2018 will also support the Critical Design Review (CDR) and initiation of the Developmental Test and Evaluation (DT&E) cartridge build. Evaluate the scalability for future combat platforms.</p> <p>Project EL9: 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 will support the integration of the munitions health monitoring system with developmental ammunition items and be used to conduct qualification tests and integrate passive time/temperature exposure sensor with developmental ammunition items and conduct qualification testing.</p> <p>Project EP2: The interim solution to the Individual Assault Munition (IAM) will be a lightweight shoulder launched munition (SLM) capability for combat units at the individual Soldier level. As an improvement over existing SLM, the interim solution will allow Soldiers to conduct Urban Operations with an ability to defeat the enemy protected by a variety of field expedient, structural and lightly armored vehicles. This interim solution will be effective day or night at close ranges with an ability to safely engage targets from within enclosures using single hearing protection. This interim solution will combine the capability of multiple existing SLM which will allow for reduced Soldier load, training complexity and logistics burden for Light Infantry, Combat Engineers and Special Operations Forces.</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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	
<p>Project EP4: 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 which allows enemy forces to see the trace round and track its trajectory back to the shooter. OWL program's objective is to develop and field a full day/night tracer round, replace the current pyrotechnic cartridges with trace cartridges that are only visible to the shooter and soldiers in close proximity, increasing soldier survivability. 7.62mm is the immediate focus followed by 5.56mm OWL cartridges and later followed by 0.50 Caliber cartridges. FY 2018 funding will support post Milestone B (MS B) activities to include Engineering and Manufacturing Development (EMD).</p> <p>Project EP5: The Advanced Armor-Piercing (ADVAP) program is a critical technology development in response to the 7.62mm and 5.56mm Family of Ammunition Capabilities Development Documents (CDD). The nomenclature for the 7.62mm ADVAP is now XM1158 and the companion trace is XM1159. The overall objective of the ADVAP program is to develop and Full Materiel Release (FMR) a 7.62mm XM1158 cartridge linked 4:1 with a trace cartridge (XM1159) followed by a 5.56mm cartridge variant that will provide overmatch capability to defeat advanced light armored threats within typical machine gun ranges. The 7.62mm XM1158 and XM1159 cartridges will be optimized for use in the M240 Machine Gun. FY 2018 funding supports Engineering and Manufacturing Development (EMD) efforts to include maturing manufacturing as well as optimization of the XM1158 and XM1159 cartridge designs.</p> <p>Project EP6: 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. Follow-on effort to reduce the weight on the .50 Cal starts in FY 2022.</p> <p>Project EP7: This project will support Integrated System Design (ISD), System Capability (SC) and Manufacturing Process Demonstrations (MPD) on current pyrotechnic munitions and tunable pyrotechnic aircraft counter measures and decoys. The project will also support ISD, SC and MPD on new expendable countermeasure munitions that will protect Army aircraft from advanced and current guided missile threats. Activities include modeling and simulation, flight testing, qualification testing, engineering to reduce size and weight, environmental considerations, safety enhancements, manufacturing enhancements, qualification of other service and foreign munitions that could meet current requirements, product improvements, insertion of new technologies to increase performance, and enhancement of current flare solutions for new and existing aircraft. Systems include impulse cartridges, pen flares, hand held signals, trip flares, simulators, marine markers, smoke pots, smoke grenades, rail road flares and other type of emergency/distress devices, aircraft expendables (to include Radio Frequency (RF) expendables), and primers used in munitions systems.</p> <p>Project EU4: The 40mm Improved High Explosive Dual Purpose (I-HEDP) is a new capability identified as a Warfighter requirement in the 40mm High Velocity I-HEDP Capability Development Document. The I-HEDP tactical cartridge provides the warfighter with the ability of achieving the required lethal effects against enemy personnel in the open, and to defeat personnel targets in defilade position. Additionally, the I-HEDP cartridge will be able to defeat unarmored and lightly armored vehicles. FY 2018 dollars support the development of the request for proposal, Bid Sample planning and testing, initiation of technical design, and programmatic oversight activities.</p> <p>Project EU7: The Enhanced Lethality Cannon Munitions (ELCM) project will evaluate, develop and qualify new lethality technologies for 155mm cannon artillery munitions and evaluate their effectiveness in mitigating evolving and derived capability gaps, and support transition to production. The ELCM project will support testing</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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>
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of the Israeli Military Industries (IMI) Systems M999 advanced cluster munition, per HQDA G-8 Directed Requirement for a Rapid Bridging Solution for the 155mm Dual Purpose Improved Conventional Munition 22 December 2016. The project will complete a safety and performance evaluation of the M999 munition in currently fielded U.S. Army 155mm cannon artillery weapon systems (M777A2, M109A6) and integration of the M999 into US Army fire control software systems. The ELCM project will accelerate the qualification of Lithographic Fragmentation Technology (LFT) 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. The project addresses requirements for increased lethality of 155mm high explosive unitary projectiles (Initial Draft Requirements for the XM1128 with Lithographic Fragmentation Technology, 24 February 2017). FY 2018 funding will support the completion of the Fire Control Integration (FCI) for the M999, the acceleration and initiation of Engineering & Manufacturing Development (EMD) of the XM1128 LFT, and the completion of XM1128 LFT EMD prototyping to begin Production Qualification Testing (PQT) series.

Project EU8: The Improved Multi-Option Fuze project will integrate the results of BA4 PE 0603639A Project EU2 and qualify/Type Classify (TC) new improved Multi-Option Fuzes (iMOFA/iMOFM) with Government-owned Next Generation Proximity Sensor (NGPS) capabilities containing 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. Continuing FMS sales of non-precision artillery and mortar ammunition fuzes containing proximity technology will increase the incidence of reverse engineering (RE) and threat of electronic countermeasures (ECM). If realized, these threats will negate the current battlefield advantages of U.S. troops. The pending policy-driven loss of Cannon DPICM will further increase the importance of NGPS / Height of Burst fuzing capabilities to efficiently engage enemy target sets. This project will develop and qualify safe, affordable, reliable Proximity/HoB fuzing solution for non- precision Cannon artillery and Mortar munitions that are resistant to adversary exploitation via ECM and RE threats. FY 2018 funding will support the preparation and award of the Engineering and Manufacturing Development (EMD) contract, and support the design, development, and fabrication of initial improved Multi-option fuzes for follow-on engineering tests and qualification of a new iMOFA/iMOFM TDP based on Government-owned Next Generation Proximity Sensor (NGPS) with Built-In HOB/DEF technology.

Project EW1: 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. FY 2018 supports Engineering and Manufacturing Development (EMD) effort for competing prototypes and initiates EMD design activities. The 40mm Low Velocity (LV) Door Breach (DB), XM1167, cartridge allows the grenadier to conduct a ballistic breach of an existing door creating an entry point into a building or other structure. This capability is critical during Urban Operations, all while having stand-off ability to conduct ballistic breach at ranges up to 50 meters away, with a single-shot, and without pause between actual breach and entry of initial force. The 40mm DB cartridge will provide the small unit with the capability to conduct breaching operations; allowing the Warfighter to create an entry point in a structure allowing an assault element to enter and begin clearing operations, which is the most difficult type of operation that Soldiers may face in an urban environment. The 40mm DB cartridge will reduce collateral damage and friendly casualties associated with breaching operations. The deployment of 40mm DB cartridges will enable the small unit to gain and maintain a tactical advantage through efficiency of combat power and momentum. FY 2018 supports Milestone B approval, Source Selection Planning and Evaluation, Government Technical Development, Bid Sample Testing, and EMD Award.

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>
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Project FA6: The 30mm Lethality program funds development of a suite of 30x173mm caliber cartridges, which includes anti-personnel tactical and training cartridges and anti-materiel tactical and training cartridges. The objective is to enhance the operational effectiveness and lethality of the Stryker Infantry Carrier Vehicle (ICV) and any Army Fighting Vehicles that are equipped with a 30x173mm weapon system. The tactical cartridges will provide an organic direct fire capability to support infantry at a greater range and will improve lethality when engaging dismounted infantry and like armored vehicles. The training cartridges will be ballistically matched to the tactical cartridges, allowing the Warfighter to train in a cost effective manner. This program will leverage earlier efforts in support of the Stryker Operational Needs Statement for Increased Lethality. FY 2018 funding will support ammunition qualification activities and development of performance specifications. FY 2018 effort also includes preparation activities for developing/qualifying a 30x173mm Programmable Airburst Munition (PABM) for production. The objective is to field airburst capable 30x173mm cartridges and programming/communication units for use in Stryker ICV and/or Army Future Fighting Vehicles.

Project S36: The Precision Guidance Kit (PGK) is a Global Positioning System guidance kit with fuzing functions. PGK provides near precision accuracy and effectiveness for 155mm High Explosive artillery projectiles. PGK improves the accuracy of existing artillery ammunition by correcting the trajectory of projectiles to their designated target location. Precision guidance systems effectively reduce target delivery error. On going development addresses performance in GPS degraded environments as well as compatibility with the Army's new long range cannon and projectiles which will be fielded during the PGK Life Cycle. FY 2018 funding will support design maturation of a PGK and a key GPS subsystem, execution of PGK anti-jam concept and subsystem development and maturation, and perform System Design Review as an entry point into Prototype development and testing.

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	21.379	80.365	130.596	-	130.596
Current President's Budget	18.037	99.165	145.232	-	145.232
Total Adjustments	-3.342	18.800	14.636	-	14.636
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-3.342	18.800	14.636	-	14.636

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) 613 / MORTAR SYSTEMS
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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
613: MORTAR SYSTEMS	-	0.000	25.148	20.115	-	20.115	32.927	25.566	10.478	8.300	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The High Explosive Guided Mortar (HEGM) project funds engineering development of precision guidance systems applicable to Indirect Fire mortar weapon systems. HEGM provides a precision capability to support the close fight in urban and complex terrain, while at the same time, reducing collateral damage. HEGM provides precision accuracy and effectiveness for 120mm mortar systems using precision guidance systems that will effectively reduce target delivery error. The HEGM capability will be developed through the use of improved guidance and control components and advanced airframe design that allow sufficient maneuver of the cartridge in flight to correct for induced error providing the ability to engage targets without the need to adjust fire.

The Weaponized Universal Lightweight Fire-control (WULF) project funds engineering development of fire-control systems applicable to Indirect Fire mortar weapon systems. WULF is a digital sight integrated with digital fire-control that is designed for aiming of the M252 81mm mortar system and other man portable mortar systems (60mm and 120mm). The digital sight unit and Fire Control will allow the Soldier to emplace the mortar systems faster and fire more accurately. WULF will improve the accuracy of the M252 mortar.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Title: HEGM</p> <p>Description: Engineering and Manufacturing Development Phase (EMD).</p> <p>FY 2017 Plans: Project initiation to enter into the EMD phase. Activities include Materiel Development Decision (MDD) approval, Milestone B Approval, award of development efforts, and initiation of preliminary design.</p> <p>FY 2018 Base Plans: Project will continue in the EMD phase. Activities will include Preliminary Design Review (PDR), award of follow on developmental efforts, and initiation of detailed design phase.</p>	-	23.148	17.780	-	17.780
<p>Title: WULF</p> <p>Description: Engineering development and software integration.</p> <p>FY 2017 Plans:</p>	-	2.000	2.335	-	2.335

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) 613 / MORTAR SYSTEMS
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Engineering development and software refinement of matured prototype to support the off Line-Replaceable-Unit Environmental test.					
<i>FY 2018 Base Plans:</i> Project will continue in the EMD phase. Activities will include Critical Design Review (CDR), engineering development, and software refinement of matured prototype to support the off Line-Replacement-Unit Environmental test and Software Development Engineering testing.					
Accomplishments/Planned Programs Subtotals	-	25.148	20.115	-	20.115

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>
• E25511: HEGM	-	-	-	-	-	-	-	18.200	25.186	445.114	488.500
• K99200: WULF	-	-	-	-	-	-	-	5.600	7.700	23.118	36.418

Remarks
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D. Acquisition Strategy
HEGM - The Acquisition Strategy was approved by the Milestone Decision Authority (MDA) in 2Q FY 17. HEGM will be procured using a Performance Specification (P-Spec). The strategy will use a DoD Ordnance Technology Consortium (DOTC) Other Transaction Agreement (OTA) initiative and a Federal Acquisition Regulations (FAR) contract. The DOTC OTA initiative is intended to result in multiple awards to cover Preliminary Design Phase requirements for FY 17. A single Full and Open FAR contract is anticipated to be awarded for the completion of EMD, Low Rate Initial Production (LRIP) and first 3 years of Full Rate Production (FRP).

WULF - Was developed under the U.S. Army Armament Research, Development and Engineering Center (ARDEC) Science & Technology initiative and currently assessed at Technology Readiness Level (TRL) 6 maturity (prototype demonstrated in a relevant environment). An Acquisition Decision Memorandum (ADM) in will be approved in 3Q FY 17 by PEO Ammunition. The project will be managed as a Modification Work Order (MWO) to M252A1 with a tailored Acquisition Strategy. Leveraging existing FIRECON-F and/or DOTC contract to multiple vendors for development during EMD phase 4Q FY 2017. Type Classification is anticipated in 2Q FY 2021. It is anticipated that a new production contract will be awarded under full and open competition. FRP is expected to begin in 4Q FY 2021 and First Unit Equipped is expected by the end of FY 2022.

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 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) 613 / MORTAR SYSTEMS
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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			
HEGM System Development Phase 1	MIPR	DoD Ordnance Technology Consortium (DOTC) - General Dynamics OTS : Bothell, WA	0.000	-		5.200	Jun 2017	-		-		-	0.000	5.200	5.200
HEGM System Development Phase 1	MIPR	DoD Ordnance Technology Consortium (DOTC) - BAE Systems : Nashu, NH	0.000	-		5.200	Jun 2017	-		-		-	0.000	5.200	5.200
HEGM System Development Phase 1	MIPR	DoD Ordnance Technology Consortium (DOTC) - Orbital ATK : Plymouth, MN	0.000	-		5.200	Jun 2017	-		-		-	0.000	5.200	5.200
HEGM System Development Phase 2	C/CPIF	TBD : TBD	0.000	-		-		11.795	Jul 2018	-		11.795	0.000	11.795	54.057
HEGM System Development Phase 3	C/CPIF	TBD : TBD	0.000	-		-		-		-		-	42.262	42.262	0.000
HEGM - Fire Control	MIPR	Armament Reasech, Development and Engineering Center (ARDEC) : Picatinny Arsenal, NJ	0.000	-		0.880	May 2017	1.070	Dec 2017	-		1.070	3.200	5.150	5.150
WULF System Development	C/CPFF	TBD : TBD	0.000	-		0.588	Sep 2017	0.741	Mar 2018	-		0.741	3.521	4.850	4.850
Subtotal			0.000	-		17.068		13.606		-		13.606	48.983	79.657	79.657

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			
HEGM - Project Manager Office	PO	Office of the Project Manager (PM)	0.000	-		2.300	May 2017	0.975	Dec 2017	-		0.975	2.113	5.388	5.388

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) 613 / MORTAR SYSTEMS
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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			
		Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ													
HEGM - ARDEC Engineering Support	MIPR	Armament Reasech, Development and Engineering Center (ARDEC) : Picatinny Arsenal, NJ	0.000	-		4.368	May 2017	1.840	Dec 2017	-		1.840	4.470	10.678	10.678
WULF - Project Manager Office	PO	Office of the Project Manager (PM) Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ	0.000	-		0.510	May 2017	0.180	Dec 2017	-		0.180	0.733	1.423	1.423
WULF - ARDEC Engineering Support	MIPR	Armament Reasech, Development and Engineering Center (ARDEC) : Picatinny Arsenal, NJ	0.000	-		0.902	May 2017	0.617	Dec 2017	-		0.617	1.227	2.746	2.746
Subtotal			0.000	-		8.080		3.612		-		3.612	8.543	20.235	20.235

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			
HEGM - Developmental Testing	MIPR	Army Test and Evaluation Command (ATEC) Yuma Proving Ground (YPG) : Yuma, AZ	0.000	-		-		2.100	Mar 2018	-		2.100	15.463	17.563	17.563
WULF - Environmental Testing	MIPR	TBD : TBD	0.000	-		-		0.527	Mar 2018	-		0.527	0.000	0.527	0.527
WULF - System Level Developmental Testing	MIPR	TBD : TBD	0.000	-		-		0.270	Mar 2018	-		0.270	4.282	4.552	4.552

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) 613 / MORTAR SYSTEMS
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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) HEGM - Materiel Development Decision (MDD)					▲ 1 MDD																								
(2) HEGM - Milestone B (MS-B)					▲ 2 MS-B																								
HEGM - Engineering & Manufacturing Development (EMD)													EMD																
HEGM - EMD Preliminary Design (SYS DEV Phase 1)									Preliminary Design																				
HEGM - EMD Detailed Design (SYS DEV Phase 2)													Detailed Design																
HEGM - EMD Qualification (SYS DEV Phase 3)																	Qualification												
(3) HEGM - Milestone C (MS-C)																					▲ 3 MS-C								
HEGM - First Article Acceptance Test (FAAT)																									■ FAAT				
HEGM - Initial Operational Test & Evaluation (IOT&E)																													■ IOT&E
(4) WULF - Acquisition Decision Memorandum (ADM)									▲ 4 ADM																				
(5) WULF - Preliminary Design Review (PDR)									▲ 5 PDR																				
WULF - Engineering & Manufacturing Development (EMD)									EMD Preliminary & Detailed Design																				
WULF - EMD Hardware Development													Hardware Development																

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) 613 / MORTAR SYSTEMS
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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
WULF - EMD Software Development																												
(1) WULF - Critical Design Review (CDR)									Software Development																			
									▲ CDR																			
WULF - Operational Assessment																	■ OA											
WULF - First Article Acceptance Test (FAAT)																									■ FAAT			
(2) WULF - Full Materiel Release (FMR)																									▲ FMR			

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) 613 / MORTAR SYSTEMS

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
HEGM - Materiel Development Decision (MDD)	2	2017	2	2017
HEGM - Milestone B (MS-B)	3	2017	3	2017
HEGM - Engineering & Manufacturing Development (EMD)	3	2017	4	2021
HEGM - EMD Preliminary Design (SYS DEV Phase 1)	3	2017	4	2018
HEGM - EMD Detailed Design (SYS DEV Phase 2)	4	2018	2	2020
HEGM - EMD Qualification (SYS DEV Phase 3)	2	2020	4	2021
HEGM - Milestone C (MS-C)	4	2021	4	2021
HEGM - First Article Acceptance Test (FAAT)	2	2022	2	2022
HEGM - Initial Operational Test & Evaluation (IOT&E)	3	2022	3	2022
WULF - Acquisition Decision Memorandum (ADM)	3	2017	3	2017
WULF - Preliminary Design Review (PDR)	1	2018	1	2018
WULF - Engineering & Manufacturing Development (EMD)	3	2017	2	2021
WULF - EMD Hardware Development	4	2018	1	2020
WULF - EMD Software Development	4	2017	2	2020
WULF - Critical Design Review (CDR)	4	2018	4	2018
WULF - Operational Assessment	3	2020	4	2020
WULF - First Article Acceptance Test (FAAT)	2	2021	3	2021
WULF - Full Materiel Release (FMR)	4	2021	4	2021

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EC1 / 40mm Hi Vel and Low Vel Thermal Training Cartridge			
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
EC1: 40mm Hi Vel and Low Vel Thermal Training Cartridge	-	6.969	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.969
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Target Practice Day Night Thermal (TP-DNT) cartridges are 40mm grenade training cartridges. The Low Velocity (LV) variant is for training with the M203/M320 grenade launchers; the High Velocity (HV) variant is for training with the Mk19 grenade machine gun. Both cartridges will provide the Warfighter with a non-dud producing, environmentally friendly training cartridge that provides a visual impact signature seen day or night, by the naked eye, through night vision devices, and thermal weapon sights. These cartridges will replace the 40mm M781 LV Target Practice and the 40mm M918/M385A1 (Mixed Belt) HV Target Practice. It is expected that the unit price for high velocity cartridges will be lower than the Mixed Belt cartridges.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Target Practice Day Night Thermal Cartridges	6.969	-	-	-	-
Description: The Target Practice Day Night Thermal (TP-DNT) Cartridges are 40mm grenade training cartridges					
FY 2016 Accomplishments: FY 2016 performed developmental engineering test activities for both HV and LV variants.					
Accomplishments/Planned Programs Subtotals	6.969	-	-	-	-

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
• Target Practice Day Night Thermal: Target Practice Day Night Thermal HV M918E1 Cartridges Procurement (SSN: E05611)	-	118.178	82.276	-	82.276	57.036	81.200	80.860	70.996	Continuing	Continuing
• Target Practice Day Night Thermal: Target Practice Day Night Thermal LV M781E1 Cartridges Procurement (SSN: E05610)	-	-	23.000	-	23.000	11.400	16.200	16.200	16.500	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EC1 / 40mm Hi Vel and Low Vel Thermal Training Cartridge

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

Production dollars will be used to procure 40mm training cartridges. If the TP-DNT production contract is delayed, it will be necessary to exercise an option on the 40mm Systems Contract and procure 40mm Mixed Belt Cartridges.

D. Acquisition Strategy

The TP-DNT cartridges are being developed through a competitive Engineering and Manufacturing Development (EMD) program. The EMD phase is developing both Low Velocity (LV) and High Velocity (HV) variants that will utilize the same critical technologies, making concurrent acquisitions a logical approach to reduce overall acquisition costs. As part of the EMD source selection, a Bid Sample shoot-off competition was conducted to evaluate potential designs. Within funding constraints, multiple contractor designs were awarded EMD contracts with intent to down select to one contractor for the HV variant and one contractor for the LV variant, after Developmental Test and Evaluation. After completion of EMD, a contract will be awarded for the Low Rate Initial Production (LRIP) with 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 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EC4 / Non-Standard Simulator Munitions			
COST (\$ in Millions)	Prior Years	FY 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
EC4: Non-Standard Simulator Munitions	-	1.915	1.092	2.839	-	2.839	3.184	2.675	2.146	2.185	0.000	16.036
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project will standardize various pyrotechnic that simulate battlefield effects. The Army's Combat Training Centers (CTCs) are currently using non-standard munitions to replicate both conventional and asymmetric warfare battlefield effects. These modified commercial-off-the-shelf products have not been type classified, material released, and are not safe or sustainable for use by Soldiers. This effort will develop and demonstrate various pyrotechnics/simulators to replicate both conventional and asymmetric warfare battlefield effects such as: Black smoke signature (burning vehicles, buildings, and equipment); Yellow smoke signature (chemical, biological or nuclear effects); Macro pyrotechnics to simulate hostile fire and small Improvised Explosive Devices (IEDs) during mounted operations in urban terrain; Micro pyrotechnics to simulate indoor hostile fire and IED effects that are capable of being integrated into existing facilities; Rocket Propelled Grenade (RPG) on a wire to replicate the flight of a Rocket Propelled Grenade; High Order Blast Effect (HOBE) used to replicate a Vehicle Borne Improvised Explosive Device (VBIED), building explosions, and other significant explosive events; Artillery airburst (LA45) simulator to replicate indirect fire; simulator to replicate a STINGER (LA47) firing; Tracer Fire-back simulator to replicate enemy small arms fire and anti-aircraft fire. Standardization will reduce training costs, eliminate redundancies between systems, mitigate environmental concerns and safety risks associated with realistic scenario based training.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Standardize Special Use Ammunition	1.915	1.092	2.839	-	2.839
Description: Standardize non-standard pyrotechnic battlefield effects currently used by CTCs .					
FY 2016 Accomplishments: Prepare and develop necessary documents to support Material Development Decision (MDD) for non standard simulator munitions.					
FY 2017 Plans: This project will support the Engineering Manufacturing and Development (EMD) phase for Force on Force Black Smoke signature (burning vehicles, buildings, and equipment), Artillery airburst simulator and Tracer/STINGER simulators. Material Release (MR) the LA45 and LA47; TC and Full Material Release (FMR) for Black Smoke Force on Target (FOT) cartridge. T&E and commence TC activities for FOT yellow smoke and Force on Force (FOF) black smoke, T&E RPG on a wire and VBIED.					
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 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EC4 / Non-Standard Simulator Munitions

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
This project will support the Engineering Manufacturing and Development (EMD) phase for Force on Force Black Smoke signature (burning vehicles, buildings, and equipment). Material Release (MR) the LA45 and LA47; TC and Full Material Release (FMR) for Black Smoke Force on Target (FOT) cartridge. T&E and commence TC activities for FOT yellow smoke and Force on Force (FOF) black smoke, T&E RPG on a wire and VBIED.					
Accomplishments/Planned Programs Subtotals	1.915	1.092	2.839	-	2.839

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
• Procurement Ammunition, Army: <i>Simulators, Non-Standard, Special Effects for CTCs; SSN E88404</i>	-	0.979	1.632	-	1.632	1.663	1.699	1.750	-	0.000	7.723

Remarks

D. Acquisition Strategy

The Acquisition strategy is for a family of special use ammunition that will be developed in incremental phases as funding and requirements are approved. MDD Approval 4th Qtr FY2017. Initial special use ammunition will be black and yellow smoke munitions followed by new increments that will defeat threats outlined in the requirements documents developed by TRADOC.

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 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) ED7 / Advanced Multipurpose (AMP) Cartridge			
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
ED7: Advanced Multipurpose (AMP) Cartridge	-	0.000	31.215	31.655	-	31.655	28.018	0.000	0.000	0.000	0.000	90.888
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 breech 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 2018 will support continuation of the Engineering and Manufacturing Development (EMD) Phase 2 which will include safety and performance testing and the manufacturing and procurement of cartridges for the third Cartridge Integration Test. FY 2018 will also support the Critical Design Review (CDR) and initiation of the Developmental Test and Evaluation (DT&E) cartridge build. Evaluate the scalability for future combat platforms.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Engineering and Manufacturing Development (EMD) Phase 1	-	2.039	-	-	-
Description: Develop, demonstrate and qualify the AMP 120mm large caliber munition.					
FY 2017 Plans: Complete Engineering and Manufacturing Development (EMD) Phase 1 including competitive shoot off, data collection/evaluation and downselect to one prime contractor in 2Q FY 2017.					
Title: Downselect / Engineering and Manufacturing Development (EMD) Phase 2	-	29.176	-	-	-
Description: Design, develop and test components and cartridges leading to a design freeze. The final design will then be carried forward to Developmental Test and Evaluation (DT&E) qualification testing to demonstrate the cartridge's ability to meet performance requirements prior to production.					
FY 2017 Plans: During Phase 2 of EMD, which begins after down select to a single contractor, a single design will be matured, analyzed, tested, and evaluated to ensure all requirements will be met/exceeded. Detailed safety and					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) ED7 / Advanced Multipurpose (AMP) Cartridge

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
performance tests will be conducted and the subsystem designs will be optimized for performance. Manufacture and procurement of cartridges for the second Cartridge Integration Test will take place during FY 2017.					
Title: Engineering and Manufacturing Development (EMD) Phase 2 Description: Design, develop and test components and cartridges leading to a design freeze. The final design will then be carried forward to Developmental Test and Evaluation (DT&E) qualification testing to demonstrate the cartridge's ability to meet performance requirements prior to production. FY 2018 Base Plans: Engineering Manufacturing Development Phase 2 will continue and include the execution of safety and performance tests which will optimize the subsystems for performance. Cartridges will also be manufactured and procured for the third Cartridge Integration Test. In 3Q FY 2018, the Critical Design Review (CDR) will occur followed by the initiation of the Developmental Test and Evaluation (DT&E) cartridge build.	-	-	31.155	-	31.155
Title: Evaluation for Future Combat Platforms Description: Evaluation of the scalability for future combat platforms. FY 2018 Base Plans: Evaluation of the scalability for future combat platforms.	-	-	0.500	-	0.500
Accomplishments/Planned Programs Subtotals	-	31.215	31.655	-	31.655

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: 0603639A / 656): 120mm Cartridge (Advanced Multipurpose-AMP)	26.485	-	-	-	-	-	-	-	-	0	26.485
• AMP (SSN: E88105): 120mm Advanced Multipurpose (AMP) Cartridge	-	-	-	-	-	25.000	30.000	40.000	48.000	Continuing	Continuing
Remarks											

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / <i>Weapons and Munitions - Eng Dev</i>	Project (Number/Name) ED7 / <i>Advanced Multipurpose (AMP) Cartridge</i>

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-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 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				ED7 / Advanced Multipurpose (AMP) Cartridge							
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			
Program Manager Maneuver Ammunition Systems (PM-MAS) Labor and travel	Various	Picatinny : NJ	1.747	-		1.148		1.260		-		1.260	Continuing	Continuing	Continuing
Orbital Alliant Techsystems Operations (OATK)	C/CPIF	OATK : Plymouth, Mn	32.450	-		23.728		23.741		-		23.741	Continuing	Continuing	Continuing
Subtotal			34.197	-		24.876		25.001		-		25.001	-	-	-
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			
Army Research, Development and Engineering Center (ARDEC)	MIPR	Picatinny : NJ	4.411	-		2.079		2.350		-		2.350	Continuing	Continuing	Continuing
Subtotal			4.411	-		2.079		2.350		-		2.350	-	-	-
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			
Yuma Test Center	MIPR	Yuma Proving Ground : AZ	1.500	-		2.123		2.295		-		2.295	Continuing	Continuing	Continuing
Aberdeen Test Center	MIPR	Aberdeen Proving Ground : MD	2.219	-		2.137		2.009		-		2.009	Continuing	Continuing	Continuing
Subtotal			3.719	-		4.260		4.304		-		4.304	-	-	-

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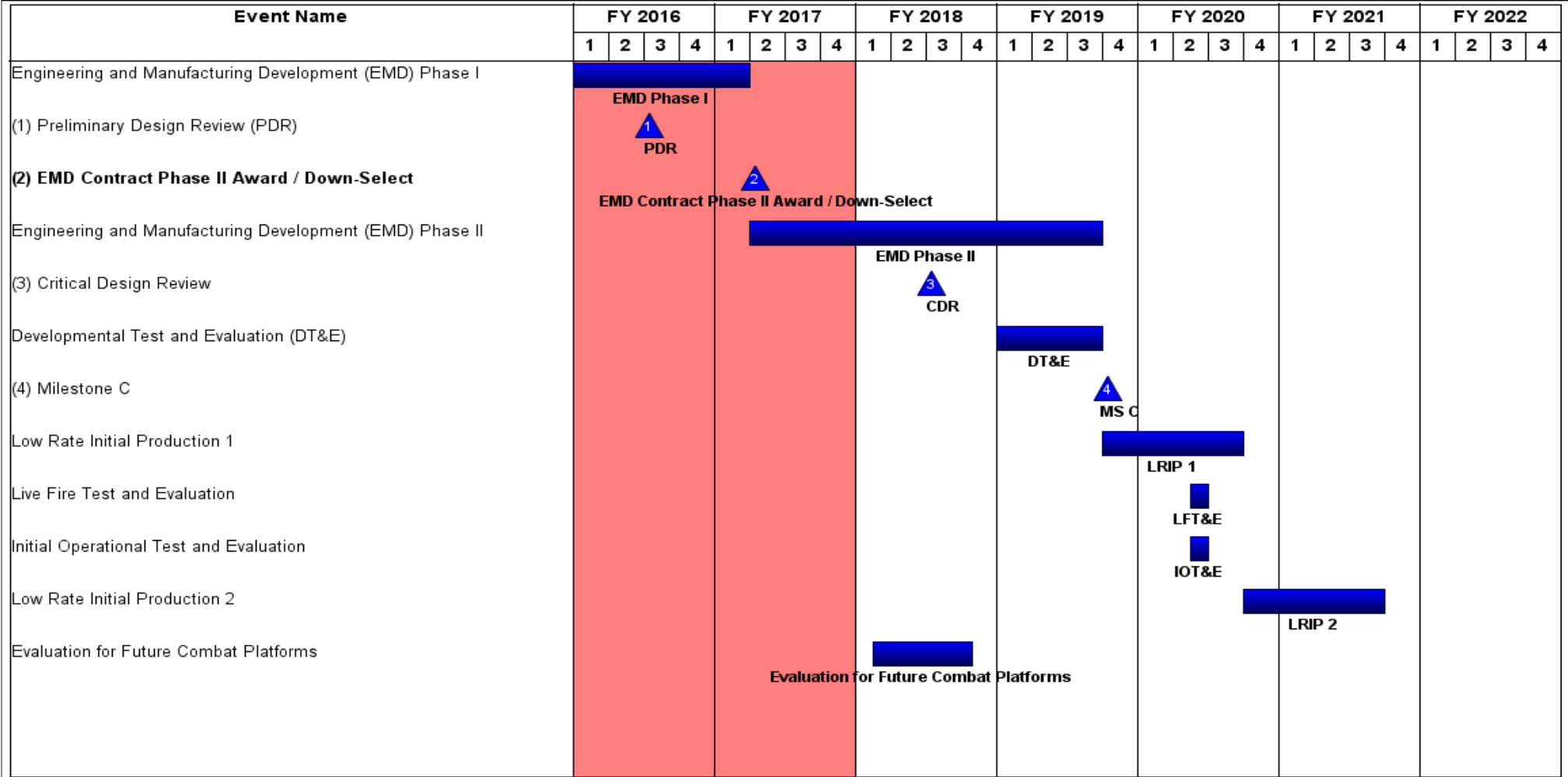
Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army								Date: May 2017					
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) ED7 / Advanced Multipurpose (AMP) Cartridge					
	Prior Years	FY 2016		FY 2017		FY 2018 Base		FY 2018 OCO		FY 2018 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	42.327	-		31.215		31.655		-		31.655	-	-	-

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) ED7 I Advanced Multipurpose (AMP) Cartridge
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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) ED7 I Advanced Multipurpose (AMP) Cartridge

Schedule Details

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

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EL9 / Ammunitions Logistics Prototyping
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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
EL9: Ammunitions Logistics Prototyping	-	0.000	0.106	0.686	-	0.686	0.798	0.986	1.041	3.755	0.000	7.372
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

Note

Note: The FY16 project EL9 funding of \$2.496M was reprogrammed as follows: \$1.206M to 0605805A project 297, \$0.950M to 0607131A ER5, and \$0.340M to 0604808A project 434.

A. Mission Description and Budget Item Justification

This project supports the future force by improving the distribution, management, reliability and survivability of ammunition through the advanced development, integration, and demonstration of logistics system enablers. These enablers will improve the efficiency and effectiveness of ammunition operations, to include retrograde, while reducing the logistics footprint on the battlefield. Technology areas addressed include handling, distribution, and management (strategic and tactical), prognostics, diagnostics, and asset visibility, explosives safety, and adaptive and environmentally friendly packaging and palletization. The efficient deployment and sustainment of reliable ammunition is vital to success on the battlefield. This project enhances the operational effectiveness of the ammunition logistics system to ensure the distribution of reliable ammunition to the warfighter.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Munitions Survivability and Logistics Enablers	-	0.106	0.686	-	0.686
Description: This program will develop ammunition logistics systems that improve munitions survivability and logistics					
FY 2017 Plans: Integrate low cost thermal indicator with developmental ammunition items and conduct qualification testing.					
FY 2018 Base Plans: Integrate the munitions health monitoring system with developmental ammunition items and conduct qualification tests. Integrate passive time/temperature exposure sensor with developmental ammunition items and conduct qualification testing.					
Accomplishments/Planned Programs Subtotals	-	0.106	0.686	-	0.686

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 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EL9 / Ammunitions Logistics Prototyping

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

Remarks

D. Acquisition Strategy

Not applicable

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 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EP2 / Individual Assault Munition (IAM)			
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
EP2: Individual Assault Munition (IAM)	-	0.000	4.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The interim solution to the Individual Assault Munition (IAM) will be a lightweight shoulder launched munition (SLM) capability for combat units at the individual Soldier level. As an improvement over existing SLM, the interim solution will allow Soldiers to conduct Urban Operations with an ability to defeat the enemy protected by a variety of field expedient, structural and lightly armored vehicles. This interim solution will be effective day or night at close ranges with an ability to safely engage targets from within enclosures using single hearing protection. This interim solution will combine the capability of multiple existing SLM which will allow for reduced Soldier load, training complexity and logistics burden for Light Infantry, Combat Engineers and Special Operations Forces. FY 2017 funding will provide the Army the opportunity to evaluate various prototype munitions to achieve emerging increased capability as an interim Individual Assault Munition.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EP4 / One-Way Luminescence for Small Caliber Ammo			
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
EP4: One-Way Luminescence for Small Caliber Ammo	-	0.000	0.000	2.688	-	2.688	5.698	6.002	11.891	6.400	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The small caliber One Way Luminescence (OWL) tracer 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. The initial focus was on 7.62mm ammunition in FY 2015 followed by 5.56mm in FY 2018; and later followed by the .50 Caliber ammunition. As the technology matures it 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 which allows enemy forces to see the trace round and track its trajectory back to the shooter. OWL program's objective is to develop and field a full day/night tracer round, replace the current pyrotechnic cartridges with trace cartridges that are only visible to the shooter and soldiers in close proximity, increasing soldier survivability. 7.62mm is the immediate focus followed by 5.56mm OWL cartridges and later followed by 0.50 Caliber cartridges. FY 2018 funding will support post Milestone B (MS B) activities to include Engineering and Manufacturing Development (EMD).

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Technology Maturation and Risk Reduction (TMRR)	-	-	2.688	-	2.688
Description: One Way Luminescence (OWL) will develop and demonstrate a full day/night tracer technology that eliminates the shortcomings of current legacy tracers.					
FY 2018 Base Plans: FY 2018 efforts will include MS B achievement, contract award for 7.62mm EMD Phase and preparation for Design Verification Tests (DVT).					
Accomplishments/Planned Programs Subtotals	-	-	2.688	-	2.688

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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 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP4 / One-Way Luminescence for Small Caliber Ammo
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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>
• PE 0603639A Project EB8: OWL for Small Caliber Ammunition	2.001	-	1.200	-	1.200	2.200	2.000	-	-	Continuing	Continuing

Remarks

One Way Luminescence (OWL) is a new tracer technology that will be applied to multiple calibers. The initial focus was on 7.62mm ammunition in FY 2015 followed by 5.56mm in FY 2018; and later followed by the .50 Caliber. As the technology matures it will be transitioned from Project 0603639A EB8 to Project 0654802A EP4 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.

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 demonstrates 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; and later followed by the .50 Caliber. 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 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EP5 / Adv Armor-Piercing (ADVAP) for Small Caliber 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
EP5: Adv Armor-Piercing (ADVAP) for Small Caliber Ammo	-	0.000	10.270	11.571	-	11.571	12.887	1.804	7.297	7.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
The small caliber Advanced Armor-Piercing (ADVAP) technology applies to multiple calibers.

A. Mission Description and Budget Item Justification

The Advanced Armor-Piercing (ADVAP) program is a critical technology development in response to the 7.62mm and 5.56mm Family of Ammunition Capabilities Development Documents (CDD). The nomenclature for the 7.62mm ADVAP is now XM1158 and the companion trace is XM1159. The overall objective of the ADVAP program is to develop and Full Materiel Release (FMR) a 7.62mm XM1158 cartridge linked 4:1 with a trace cartridge (XM1159) followed by a 5.56mm cartridge variant that will provide overmatch capability to defeat advanced light armored threats within typical machine gun ranges. The 7.62mm XM1158 and XM1159 cartridges will be optimized for use in the M240 Machine Gun. FY 2018 funding supports Engineering and Manufacturing Development (EMD) efforts to include maturing manufacturing as well as optimization of the XM1158 and XM1159 cartridge designs.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: 7.62mm Engineering & Manufacturing Development (EMD)	-	10.270	11.571	-	11.571
Description: Develop, demonstrate, and qualify XM1158 Small Caliber Ammunition 7.62mm ADVAP cartridges in order to defeat threat targets and provide overmatch capability versus a broad spectrum of hard targets.					
FY 2017 Plans: FY 2017 efforts will be focused on facilitization work and optimization of the full-up 7.62mm XM1158 cartridge design, as well as an evaluation of a trace cartridge design. Manufacturing process will be matured in order to support qualification test builds in FY 2018.					
FY 2018 Base Plans: FY 2018 efforts will be focused on Engineering and Manufacturing Development (EMD) to include maturing manufacturing as well as optimization of the XM1158 and XM1159 cartridge designs, and Pre-Production Qualification Test (PPQT) to support Critical Design Review (CDR) and Production Qualification Test (PQT) in FY 2019.					
Accomplishments/Planned Programs Subtotals	-	10.270	11.571	-	11.571

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP5 / Adv Armor-Piercing (ADVAP) for Small Caliber Ammo

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>
• PE 0603639A Project EC2: <i>Advanced Armor-Piercing (ADVAP) for Small Cal Ammunition</i>	7.700	-	-	-	-	3.800	6.900	-	-	Continuing	Continuing

Remarks

The funding line continues the development work for 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-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 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				EP5 / Adv Armor-Piercing (ADVAP) for Small Caliber Ammo							
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
Program Manager Maneuver Ammunition Systems (PM MAS) - Labor & Travel	Various	Picatinny Arsenal : New Jersey	0.000	-		0.200		0.271		-		0.271	Continuing	Continuing	Continuing
Raw Materials	Various	TBD : TBD	0.000	-		1.200		4.629		-		4.629	Continuing	Continuing	Continuing
Facilitization and Prototyping	MIPR	Picatinny Arsenal : New Jersey	0.000	-		4.400		1.200		-		1.200	Continuing	Continuing	Continuing
Subtotal			0.000	-		5.800		6.100		-		6.100	-	-	-
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
Armament Research Development and Engineering Center (ARDEC)	MIPR	Picatinny Arsenal : New Jersey	0.000	-		3.270		3.600		-		3.600	Continuing	Continuing	Continuing
Army Research Lab (ARL)	MIPR	Aberdeen Proving Grounds : Maryland	0.000	-		1.200		0.850		-		0.850	Continuing	Continuing	Continuing
Subtotal			0.000	-		4.470		4.450		-		4.450	-	-	-
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
U.S. Army Aberdeen Test Center (ATC)	MIPR	Aberdeen Proving Grounds : Maryland	0.000	-		-		0.650		-		0.650	Continuing	Continuing	Continuing
Test Articles	TBD	Picatinny Arsenal : New Jersey	0.000	-		-		0.371		-		0.371	Continuing	Continuing	Continuing
Subtotal			0.000	-		-		1.021		-		1.021	-	-	-

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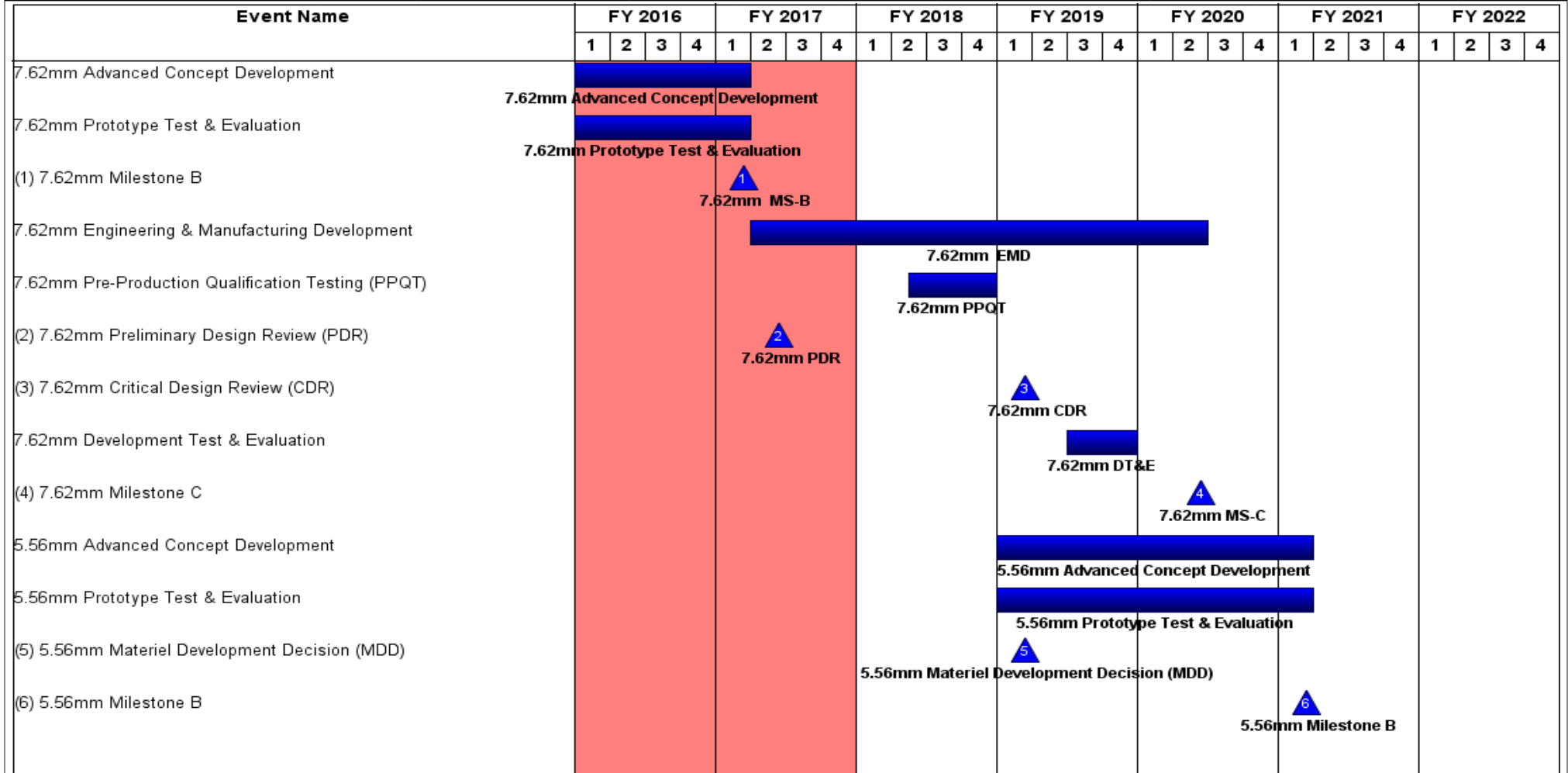
Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army								Date: May 2017					
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EP5 / Adv Armor-Piercing (ADVAP) for Small Caliber Ammo					
	Prior Years	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	-		10.270		11.571		-		11.571	-	-	-

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP5 / Adv Armor-Piercing (ADVAP) for Small Caliber Ammo
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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP5 / Adv Armor-Piercing (ADVAP) for Small Caliber Ammo
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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
5.56mm Engineering & Manufacturing Development																												
(1) 5.56mm Preliminary Design Review (PDR)																												
5.56mm Pre-Production Qualification Testing (PPQT)																												
(2) 5.56mm Critical Design Review (CDR)																												

5.56mm EMD

▲ 5.56mm PDR

5.56mm PPQT

▲ 5.56mm CDR

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP5 / Adv Armor-Piercing (ADVAP) for Small Caliber Ammo

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
7.62mm Advanced Concept Development	1	2015	1	2017
7.62mm Prototype Test & Evaluation	1	2015	1	2017
7.62mm Milestone B	1	2017	1	2017
7.62mm Engineering & Manufacturing Development	2	2017	2	2020
7.62mm Pre-Production Qualification Testing (PPQT)	2	2018	4	2018
7.62mm Preliminary Design Review (PDR)	2	2017	2	2017
7.62mm Critical Design Review (CDR)	1	2019	1	2019
7.62mm Development Test & Evaluation	3	2019	4	2019
7.62mm Milestone C	2	2020	2	2020
5.56mm Advanced Concept Development	1	2019	1	2021
5.56mm Prototype Test & Evaluation	1	2019	1	2021
5.56mm Materiel Development Decision (MDD)	1	2019	1	2019
5.56mm Milestone B	1	2021	1	2021
5.56mm Engineering & Manufacturing Development	2	2021	2	2024
5.56mm Preliminary Design Review (PDR)	2	2021	2	2021
5.56mm Pre-Production Qualification Testing (PPQT)	1	2022	3	2022
5.56mm Critical Design Review (CDR)	4	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EP6 / Lightweight Cartridge Case for Small Caliber 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
EP6: <i>Lightweight Cartridge Case for Small Caliber Ammo</i>	-	0.000	1.290	0.000	-	0.000	0.000	0.000	0.000	2.000	0.000	3.290
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. Follow-on effort for .50 Cal in FY 2022.

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. Follow-on effort to reduce the weight on the .50 Cal starts in FY 2022.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: 7.62mm Engineering and Manufacturing Development (EMD) for Lightweight Small Caliber Ammunition (LSCA)	-	1.290	-	-	-
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 2017 Plans: In FY 2017, the Government completes Phase I Industrial Impacts Study with existing Small Caliber Producers, conducts Source Selection and awards a contract to initiate Phase II activities.					
Accomplishments/Planned Programs Subtotals	-	1.290	-	-	-

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 0603639A Project EL8: <i>Lightweight Cartridge Case for Small Caliber Ammunition</i>	1.299	1.280	2.500	-	2.500	-	-	-	-	0.000	5.079

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP6 / Lightweight Cartridge Case for Small Caliber Ammo

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
• PE 0607131A Project ER6: Direct Fire Technology	-	-	0.855	-	0.855	4.300	0.500	-	-	Continuing	Continuing

Remarks

The funding lines continue work on the 7.62mm ammunition.

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. The .50 Cal will follow a similar multiphase strategy.

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 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev					Project (Number/Name) EP7 / Aviation Airborne Expandable Countermeasures		
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
EP7: Aviation Airborne Expandable Countermeasures	-	0.000	1.431	7.500	-	7.500	7.300	5.800	0.000	16.400	0.000	38.431
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The program will transition from 0603639 EB9.

A. Mission Description and Budget Item Justification

This project will support Integrated System Design (ISD), System Capability (SC) and Manufacturing Process Demonstrations (MPD) on current pyrotechnic munitions and tunable pyrotechnic aircraft counter measures and decoys. The project will also support ISD, SC and MPD on new expendable countermeasure munitions that will protect Army aircraft from advanced and current guided missile threats. Activities include modeling and simulation, flight testing, qualification testing, engineering to reduce size and weight, environmental considerations, safety enhancements, manufacturing enhancements, qualification of other service and foreign munitions that could meet current requirements, product improvements, insertion of new technologies to increase performance, and enhancement of current flare solutions for new and existing aircraft. Systems include impulse cartridges, pen flares, hand held signals, trip flares, simulators, marine markers, smoke pots, smoke grenades, rail road flares and other type of emergency/distress devices, aircraft expendables (to include Radio Frequency (RF) expendables), and primers used in munitions systems.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Improvements to countermeasure flares	-	1.431	7.500	-	7.500
Description: This program will develop improvements to legacy countermeasure flare solutions and qualify them for Army use.					
FY 2017 Plans: Conduct flight effectiveness testing on Army platforms based on M&S results. Generate necessary documentation to support Airworthiness (AWR) and fielding of new countermeasure solutions.					
FY 2018 Base Plans: Conduct flight effectiveness testing on Army platforms based on M&S results. Generate necessary documentation to support Airworthiness (AWR) and fielding of new countermeasure solutions.					
Accomplishments/Planned Programs Subtotals	-	1.431	7.500	-	7.500

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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 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EP7 / Aviation Airborne Expandable Countermeasures
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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>
• 0603639A - Tank and Medium Caliber: EB9 - Tunable Pyrotechnic Aircraft Countermeasure Flares	1.662	3.400	1.000	-	1.000	1.600	-	-	2.600	0	10.262

Remarks

D. Acquisition Strategy

The Acquisition strategy is under development and will be approved by the Milestone Decision Authority (MDA) in 4Q FY2017. It is anticipated that these items will be restricted to the National Technology and Industrial Base (NTIB).

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 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EU4 / 40mm HV Improved High Explosive Dual Purpose			
COST (\$ in Millions)	Prior Years	FY 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
EU4: 40mm HV Improved High Explosive Dual Purpose	-	0.000	0.303	3.191	-	3.191	7.288	13.207	2.970	2.341	0.000	29.300
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

N/A

A. Mission Description and Budget Item Justification

The 40mm Improved High Explosive Dual Purpose (I-HEDP) is a new capability identified as a Warfighter requirement in the 40mm High Velocity I-HEDP Capability Development Document. The I-HEDP tactical cartridge provides the warfighter with the ability of achieving the required lethal effects against enemy personnel in the open, and to defeat personnel targets in defilade position. Additionally, the I-HEDP cartridge will be able to defeat unarmored and lightly armored vehicles. FY 2018 dollars support the development of the request for proposal, Bid Sample planning and testing, initiation of technical design, and programmatic oversight activities.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Pre Engineering Manufacturing Development Activities	-	0.303	-	-	-
Description: Pre-award activities need to be completed prior to the start of EMD.					
FY 2017 Plans: Funds in FY 2017 supports key accomplishments to include the development/approval of Acquisition Strategy, Milestone B activities, and procurement support documents.					
Title: Engineering Manufacturing Development Activities	-	-	3.191	-	3.191
Description: After Milestone B approval, Request for Proposal (RFP) documents and EMD Bid Sample planning and testing needs to be accomplished.					
FY 2018 Base Plans: Funding in FY 2018 supports key activities in preparation for the Milestone B decision, Request for Proposal, the Engineering and Manufacturing Development (EMD) Bid sample testing, initiation of technical design activities, and programmatic oversights.					
Accomplishments/Planned Programs Subtotals	-	0.303	3.191	-	3.191

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU4 / 40mm HV Improved High Explosive Dual Purpose

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

N/A

Remarks

D. Acquisition Strategy

The 40mm High Velocity Improved High Explosive Dual Purpose (I-HEDP) cartridge will be developed through a competitive EMD program. Milestone B approval is expected at the end of 1QTR FY 2018, followed by the award to one EMD contractor after the bid sample testing and source selection evaluation. The contractor will mature the I-HEDP cartridge through Design Engineering Test (DET). Shortcomings and deficiencies will be corrected prior to subjecting the final design to the Developmental Test & Evaluation. The test results will support the documentation for Milestone C and Type Classification-Limited Procurement (TC-LP), which is scheduled for the end of 3QTR FY 2021. After Milestone C is achieved, a contract will be awarded for Low Rate Initial Production (LRIP) followed by 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 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EU7 / 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
EU7: Enhanced Lethality Cannon Munitions	-	0.000	8.000	20.500	-	20.500	8.000	8.000	8.000	0.000	0.000	52.500
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Enhanced Lethality Cannon Munitions (ELCM) project will evaluate, develop and qualify new lethality technologies for 155mm cannon artillery munitions and evaluate their effectiveness in mitigating evolving and derived capability gaps, and support transition to production. The ELCM project will support testing of the Israeli Military Industries (IMI) Systems M999 advanced cluster munition, per HQDA G-8 Directed Requirement for a Rapid Bridging Solution for the 155mm Dual Purpose Improved Conventional Munition 22 December 2016. The project will complete a safety and performance evaluation of the M999 munition in currently fielded U.S. Army 155mm cannon artillery weapon systems (M777A2, M109A6) and integration of the M999 into US Army fire control software systems. The ELCM project will accelerate the qualification of Lithographic Fragmentation Technology (LFT) 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. The project addresses requirements for increased lethality of 155mm high explosive unitary projectiles (Initial Draft Requirements for the XM1128 with Lithographic Fragmentation Technology, 24 February 2017).

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: 155mm M999 IMI Projectile with M99 Submunitions	-	8.000	2.000	-	2.000
Description: M999 testing assessment of performance, safety, and UXO rates.					
FY 2017 Plans: Conduct UXO and safety testing on the M999 155mm IMI Projectile to support Vice Chief of Staff Army (VCSA) briefing scheduled for November 2017.					
FY 2018 Base Plans: Complete Fire Control Integration (FCI) for the M999.					
Title: 155mm XM1128 High Explosive Projectile	-	-	18.500	-	18.500
Description: Evaluate, Develop, and Qualify Enhanced Lethality Technologies.					
FY 2018 Base Plans: Accelerate and initiate Engineering & Manufacturing Development (EMD) of the XM1128 LFT. Complete EMD prototyping to begin Production Qualification Testing (PQT) series.					
Accomplishments/Planned Programs Subtotals	-	8.000	20.500	-	20.500

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU7 / Enhanced Lethality Cannon Munitions

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>
• BA4 PE 0603639A Project EU1: <i>Enhanced Lethality Cannon Munitions</i>	-	9.866	10.000	-	10.000	-	-	-	-	0	19.866

Remarks

D. Acquisition Strategy

XM1128 High Explosive munition will be accelerated for qualification, per HQDA G-8 Directed Requirement for a Rapid Bridging Solution for the 155mm Dual Purpose Improved Conventional Munition (DPICM) 22 December 2016, as an inherent part of the Rapid Bridging solution for 155mm DPICM.

Prototyping will be awarded in 1Q FY 2018 through a DoD Ordnance Technology Consortium (DOTC) contracts to multiple vendors (subcontractors to U.S. Government system integrator) through EMD. The U.S. Government will lead EMD effort to complete development by end 2Q FY 2020. Milestone C approval is anticipated in 2Q FY 2020.

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 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU7 / Enhanced Lethality Cannon Munitions
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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			
XM1128 LFT Hardware	MIPR	Various : TBD	0.000	-		-		10.070		-		10.070	0.967	11.037	0.000
Subtotal			0.000	-		-		10.070		-		10.070	0.967	11.037	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			
M999 Program Management	Various	Office of the Project Manager (PM) Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ	0.000	-		0.240		0.200		-		0.200	0.000	0.440	0.000
M999 Engineering Support	MIPR	Armament Reasech, Development and Engineering Center (ARDEC) : Picatinny Arsenal, NJ	0.000	-		1.300		1.800		-		1.800	0.000	3.100	0.000
XM1128 Program Management	Various	Office of the Project Manager (PM) Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ	0.000	-		-		1.000		-		1.000	1.500	2.500	0.000
XM1128 Engineering Support	MIPR	Armament Reasech Development and Engineering Center (ARDEC) : Picatinny Arsenal, NJ	0.000	-		-		3.960		-		3.960	5.940	9.900	0.000
Subtotal			0.000	-		1.540		6.960		-		6.960	7.440	15.940	0.000

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU7 / Enhanced Lethality Cannon Munitions
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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			
M999 Testing	MIPR	Army Test and Evaluation Command (ATEC) Yuma Proving Ground (YPG) : Yuma, AZ	0.000	-		1.100		-		-		-	0.000	1.100	0.000
M999 Testing	MIPR	Combating Terrorism Technical Support Office (CTTSO) : Israel	0.000	-		5.360		-		-		-	0.000	5.360	0.000
XM1128 Testing	MIPR	Army Test and Evaluation Command (ATEC) Yuma Proving Ground (YPG) : Yuma, AZ	0.000	-		-		2.089		-		2.089	1.793	3.882	0.000
XM1128 Testing	MIPR	Naval Surface Warfare Center (NSWC) – Dahlgren : Dahlgren, VA	0.000	-		-		1.031		-		1.031	0.000	1.031	0.000
XM1128 Testing	MIPR	National Technical Systems (NTS) : Camden, AR	0.000	-		-		0.350		-		0.350	0.000	0.350	0.000
Subtotal			0.000	-		6.460		3.470		-		3.470	1.793	11.723	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	-	8.000	20.500	-	20.500	10.200	38.700	0.000

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU7 / Enhanced Lethality Cannon Munitions
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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				
M999 IMOD Qual Testing Israel																																
M999 Testing																																
M999 Fire Control Integration																																
(1) M999 Final Report																									 M999 Final Report							
XM1128 Prototyping; BA4 PE 0603639A EU1																																
(2) XM1128 Preliminary Design Review (PDR)																					 XM1128 PDR											
XM1128 Lethality Testing; BA4 PE 0603639A EU1																																
XM1128 Lethality Assessment; BA4 PE 0603639A EU1																																
XM1128 Baseline Prototyping																																
(3) XM1128 Critical Design Review (CDR)																									 XM1128 CDR							
XM1128 Performance Qualification Testing (PQT)																																
(4) XM1128 Milestone C																																

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU7 / Enhanced Lethality Cannon Munitions

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
M999 IMOD Qual Testing Israel	4	2017	2	2018
M999 Testing	1	2018	1	2018
M999 Fire Control Integration	2	2018	2	2019
M999 Final Report	4	2018	4	2018
XM1128 Prototyping; BA4 PE 0603639A EU1	3	2017	4	2017
XM1128 Preliminary Design Review (PDR)	4	2017	4	2017
XM1128 Lethality Testing; BA4 PE 0603639A EU1	4	2017	4	2017
XM1128 Lethality Assessment; BA4 PE 0603639A EU1	4	2017	1	2018
XM1128 Baseline Prototyping	1	2018	3	2018
XM1128 Critical Design Review (CDR)	3	2018	3	2018
XM1128 Performance Qualification Testing (PQT)	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 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EU8 / Improved Multi-Option Fuze			
COST (\$ in Millions)	Prior Years	FY 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
EU8: Improved Multi-Option Fuze	-	0.000	0.000	8.000	-	8.000	8.000	10.000	0.000	0.000	0.000	26.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project EU8 is not a new start in FY2018; the program is a continuation from PE 0603639A Project EU2 Improved Multi-Option Fuze (iMOFA/iMOFM).

A. Mission Description and Budget Item Justification

This project will integrate the results of BA4 PE 0603639A Project EU2 and qualify/Type Classify (TC) new improved Multi-Option Fuzes (iMOFA/iMOFM) with Government-owned Next Generation Proximity Sensor (NGPS) capabilities containing 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. Continuing FMS sales of non-precision artillery and mortar ammunition fuzes containing proximity technology will increase the incidence of reverse engineering (RE) and threat of electronic countermeasures (ECM). If realized, these threats will negate the current battlefield advantages of U.S. troops. The pending policy-driven loss of Cannon DPICM will further increase the importance of NGPS / Height of Burst fuzing capabilities to efficiently engage enemy target sets. This project will develop and qualify safe, affordable, reliable Proximity/ HoB fuzing solution for non- precision Cannon artillery and Mortar munitions that are resistant to adversary exploitation via ECM and RE threats.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Improved Multi-Option Fuze Development	-	-	8.000	-	8.000
Description: Develop and qualify improved multi-option fuze technologies.					
FY 2018 Base Plans: Will prepare and award the Engineering and Manufacturing Development (EMD) contract as well as the EMD design, development, and fabrication of initial improved Multi-option fuzes for follow-on engineering tests and qualification of new iMOFA/iMOFM TDP based on Government-owned Next Generation Proximity Sensor (NGPS) w/Built-In HOB DEF technology.					
Accomplishments/Planned Programs Subtotals	-	-	8.000	-	8.000

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EU8 / Improved Multi-Option Fuze

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

<u>Line Item</u>	<u>FY 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>
• BA4 PE 0603639A Project EU2: Improved Multi-Option Fuze (iMOFA/iMOFM)	-	-	-	-	-	-	-	-	-	0	0.000

Remarks

Project EU8 is not a new start in FY2018; the program is a continuation from PE 0603639A Project EU2 Improved Multi-Option Fuze (iMOFA/iMOFM).

D. Acquisition Strategy

Improved Multi-Option Fuze programs of record via subsequent Engineering and Manufacturing Development (EMD) program for Type Classification (TC) 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. Qualified iMOFA will be a TRL 8 TC design with a mature TDP for production. Parallel iMOFM effort will be a qualified TRL 8 design and replace current MOFMs in appropriate ongoing production mortar cartridges.

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 / 5					R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev				Project (Number/Name) EW1 / 40mm LV High Explosive Air Burst, XM1166			
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
EW1: 40mm LV High Explosive Air Burst, XM1166	-	0.000	0.353	9.678	-	9.678	13.412	14.195	21.553	1.500	0.000	60.691
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funds in the 0604802A EW1 40mm program beginning in FY 2018 include both the 40mm Low Velocity High Explosive Air Burst (HEAB) XM1166 and 40mm Low Velocity Door Breach (DB) XM1167 funds. The DB XM1167 funds will be on this line until a separate funding line is established. The 40mm Door Breach Program is a new start in FY 2018.

A. Mission Description and Budget Item Justification

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. FY 2018 supports Engineering and Manufacturing Development (EMD) effort for competing prototypes and initiates EMD design activities.

The 40mm Low Velocity (LV) Door Breach (DB), XM1167, cartridge allows the grenadier to conduct a ballistic breach of an existing door creating an entry point into a building or other structure. This capability is critical during Urban Operations, all while having stand-off ability to conduct ballistic breach at ranges up to 50 meters away, with a single-shot, and without pause between actual breach and entry of initial force. The 40mm DB cartridge will provide the small unit with the capability to conduct breaching operations; allowing the Warfighter to create an entry point in a structure allowing an assault element to enter and begin clearing operations, which is the most difficult type of operation that Soldiers may face in an urban environment. The 40mm DB cartridge will reduce collateral damage and friendly casualties associated with breaching operations. The deployment of 40mm DB cartridges will enable the small unit to gain and maintain a tactical advantage through efficiency of combat power and momentum. FY 2018 supports Milestone B approval, Source Selection Planning and Evaluation, Government Technical Development, Bid Sample Testing, and EMD Award.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: 40mm Low Velocity High Explosive Air Burst (HEAB), XM1166 EMD	-	0.050	-	-	-
Description: Engineering Manufacturing Development Activities					
FY 2017 Plans:					

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) EW1 / 40mm LV High Explosive Air Burst, XM1166
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
FY 2017 supports Milestone B activities and contract preparation.					
Title: 40mm Low Velocity High Explosive Air Burst (HEAB), XM1166 Description: Engineering Manufacturing Development FY 2017 Plans: FY 2017 initiate EMD with one or more contract awards for competing prototypes. FY 2018 Base Plans: FY 2018 Award two contracts for competing prototypes and activities will include fabrication and testing of prototype hardware for design optimization.	-	0.303	5.500	-	5.500
Title: 40mm Low Velocity Door Breach (DB), XM1167 Description: Engineering Manufacturing Development Activities FY 2018 Base Plans: FY 2018 primary activities include Milestone B approval and Bid Sample Test competition. In preparation for contract award, a Performance Specification will be developed, a Request for Proposal (RFP) will be prepared, a release and review of proposals will take place, and source selection will occur.	-	-	4.178	-	4.178
Accomplishments/Planned Programs Subtotals	-	0.353	9.678	-	9.678

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
• 0603639A 694: <i>Medium Caliber Ammunition 0603639A 694</i>	-	2.170	-	-	-	-	-	-	-	0.000	2.170
• 40mm LV, IRAP Cartridges: <i>Procurement (SSN E71005)</i>	-	-	-	-	-	-	-	-	11.200	Continuing	Continuing

Remarks

D. Acquisition Strategy
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

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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 / 5	PE 0604802A / Weapons and Munitions - Eng Dev	EW1 / 40mm LV High Explosive Air Burst, XM1166

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.

The Door Breach cartridge will be developed through a Competitive Bid Sample Test followed by a single award for an EMD program, which will consist of a 12-month qualification 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 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FA6 / 30mm Lethality
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COST (\$ in Millions)	Prior Years	FY 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
FA6: 30mm Lethality	-	0.000	0.000	12.000	-	12.000	14.000	9.000	12.000	7.000	0.000	54.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
30mm Lethality is a new start in FY 2018

A. Mission Description and Budget Item Justification

The 30mm Lethality program funds development of a suite of 30x173mm caliber cartridges, which includes anti-personnel tactical and training cartridges and anti-materiel tactical and training cartridges. The objective is to enhance the operational effectiveness and lethality of the Stryker Infantry Carrier Vehicle (ICV) and any Army Fighting Vehicles that are equipped with a 30x173mm weapon system. The tactical cartridges will provide an organic direct fire capability to support infantry at a greater range and will improve lethality when engaging dismounted infantry and like armored vehicles. The training cartridges will be ballistically matched to the tactical cartridges, allowing the Warfighter to train in a cost effective manner. This program will leverage earlier efforts in support of the Stryker Operational Needs Statement for Increased Lethality. FY 2018 funding will support ammunition qualification activities and development of performance specifications. FY 2018 effort also includes preparation activities for developing/qualifying a 30x173mm Programmable Airburst Munition (PABM) for production. The objective is to field airburst capable 30x173mm cartridges and programming/communication units for use in Stryker ICV and/or Army Future Fighting Vehicles.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: 30X173mm Suite of Ammunition	-	-	12.000	-	12.000
Description: Engineering and Manufacturing Development Preparatory Activities and Ammunition Qualification Activities.					
FY 2018 Base Plans: FY 2018 primary activities include awarding contract to purchase qualification hardware for suite of four ammunition. And, preparing for contracts to develop/qualify a 30x173mm Programmable Airburst Munition (PABM).					
Accomplishments/Planned Programs Subtotals	-	-	12.000	-	12.000

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 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FA6 / 30mm Lethality

D. Acquisition Strategy

A Request for Proposal (RFP) will be sent to industry soliciting responses to the requirements of Army Performance Specifications for the following items: 30x173mm anti-materiel tactical cartridge, 30x173mm anti-materiel training cartridge, 30x173mm anti-personnel tactical cartridge, and 30x173mm anti-personnel training cartridge, and 30x173mm airburst cartridge. Contracts will be awarded to viable contractors for the development and qualification of each family of cartridges (anti-personnel family and anti-materiel family). Contractor designs will be subjected to Design Verification Tests. Based on technical performance/maturity and cost, production contracts may be awarded for each family of cartridges. The objective is to qualify two contract sources for the each cartridge.

E. Performance Metrics

N/A

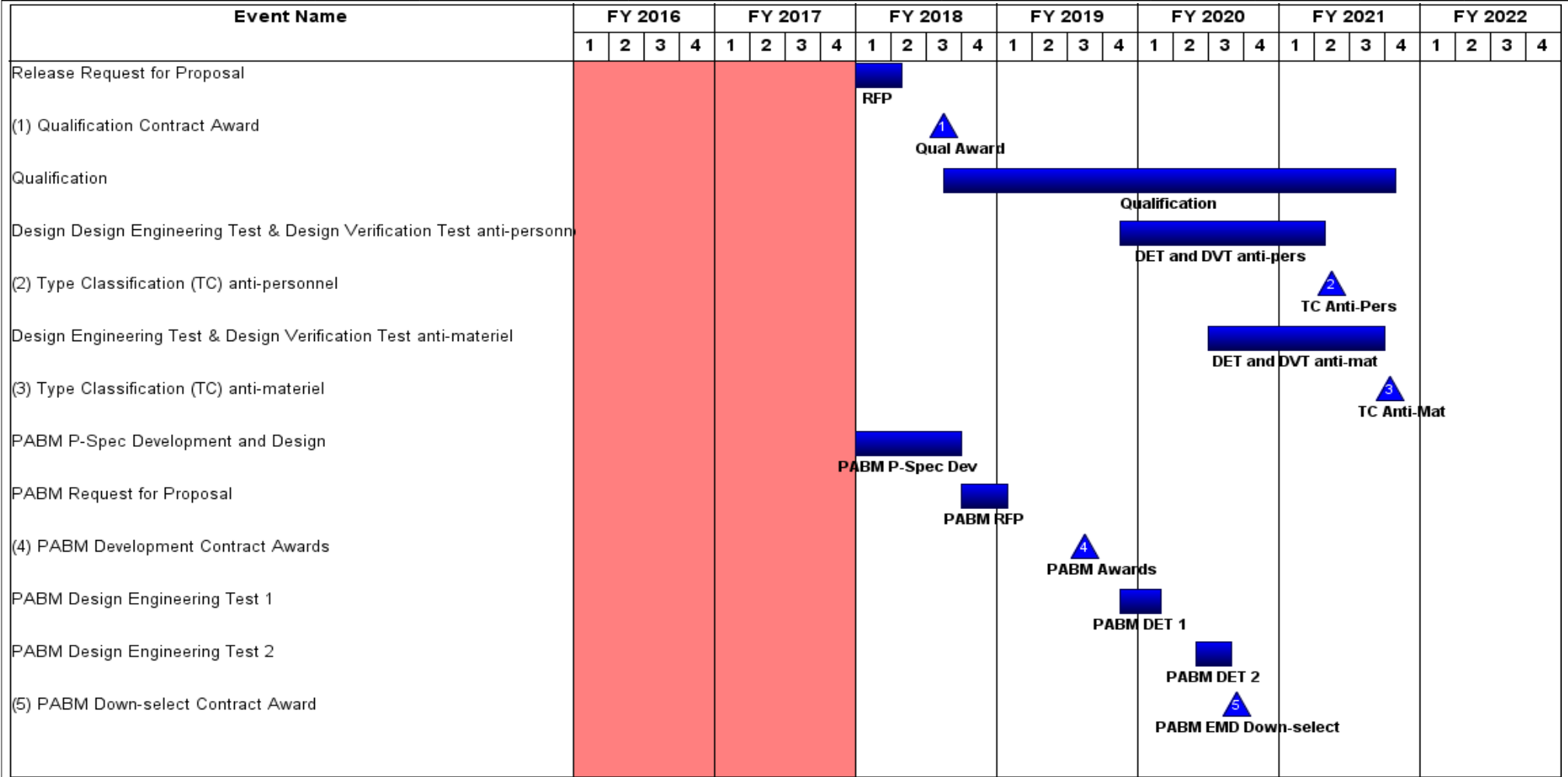
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Exhibit R-3, RDT&E Project Cost Analysis: FY 2018 Army												Date: May 2017				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0604802A / Weapons and Munitions - Eng Dev				FA6 / 30mm Lethality								
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	
Program Manager Maneuver Ammunition Systems (PM MAS) labor and travel	Various	Picatinny Arsenal : NJ	0.000	-		-		0.400		-		0.400	Continuing	Continuing	Continuing	
Ammo Development/Qualification Contract	Option/TBD	TBD : TBD	0.000	-		-		8.000		-		8.000	Continuing	Continuing	Continuing	
Subtotal			0.000	-		-		8.400		-		8.400	-	-	-	
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	
Armament Research, Development, and Engineering Center (ARDEC)	MIPR	Picatinny Arsenal : NJ	0.000	-		-		2.600		-		2.600	Continuing	Continuing	Continuing	
Subtotal			0.000	-		-		2.600		-		2.600	-	-	-	
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	
Aberdeen Proving Ground	MIPR	Aberdeen Proving Ground : Aberdeen, MD	0.000	-		-		1.000		-		1.000	Continuing	Continuing	Continuing	
Subtotal			0.000	-		-		1.000		-		1.000	-	-	-	
Project Cost Totals			0.000	-		0.000		12.000		-		12.000	-	-	-	
Remarks																

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FA6 / 30mm Lethality
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Exhibit R-4, RDT&E Schedule Profile: FY 2018 Army **Date:** May 2017

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FA6 / 30mm Lethality
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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
PABM Engineering & Manufacturing and Development (EMD)																												
PABM Developmental Test & Evaluation (DT&E)																												
(1) PABM Milestone C																												
PABM Live Fire Test and Evaluation (LFT&E)																												
PABM Initial Operational Test and Evaluation (IOT&E)																												

PABM EMD

PABM DT&E
▲
PABM MS C

PABM LFT

PABM IOT

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) FA6 / 30mm Lethality

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Release Request for Proposal	1	2018	2	2018
Qualification Contract Award	3	2018	3	2018
Qualification	3	2018	4	2021
Design Design Engineering Test & Design Verification Test anti-personnel	4	2019	2	2021
Type Classification (TC) anti-personnel	2	2021	2	2021
Design Engineering Test & Design Verification Test anti-materiel	3	2020	3	2021
Type Classification (TC) anti-materiel	4	2021	4	2021
PABM P-Spec Development and Design	1	2018	3	2018
PABM Request for Proposal	4	2018	1	2019
PABM Development Contract Awards	3	2019	3	2019
PABM Design Engineering Test 1	4	2019	1	2020
PABM Design Engineering Test 2	2	2020	3	2020
PABM Down-select Contract Award	3	2020	3	2020
PABM Engineering & Manufacturing and Development (EMD)	4	2020	1	2022
PABM Developmental Test & Evaluation (DT&E)	2	2021	4	2021
PABM Milestone C	1	2022	1	2022
PABM Live Fire Test and Evaluation (LFT&E)	3	2022	1	2023
PABM Initial Operational Test and Evaluation (IOT&E)	3	2022	1	2023

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) S36 / Precision Guidance Kit
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COST (\$ in Millions)	Prior Years	FY 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
S36: Precision Guidance Kit	-	9.153	15.957	14.809	-	14.809	5.980	8.169	8.384	8.624	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Precision Guidance Kit (PGK) is a Global Positioning System guidance kit with fuzing functions. PGK provides near precision accuracy and effectiveness for 155mm High Explosive artillery projectiles. PGK improves the accuracy of existing artillery ammunition by correcting the trajectory of projectiles to their designated target location. Precision guidance systems effectively reduce target delivery error. On going development addresses performance in GPS degraded environments as well as compatibility with the Army's new long range cannon and projectiles which will be fielded during the PGK Life Cycle.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Title: Contractor Engineering and Manufacturing Development</p> <p>Description: Contractor Engineering and Manufacturing Development</p> <p>FY 2016 Accomplishments: GPS Design maturation of a PGK with Anti-Jam capability including prototype development and testing.</p> <p>FY 2017 Plans: GPS Design maturation of a PGK with Anti-Jam capability including System Requirements Review and System Functional Review.</p> <p>FY 2018 Base Plans: Design maturation of a PGK and a key GPS subsystem.</p>	6.671	13.707	11.550	-	11.550
<p>Title: Government and Engineering Support</p> <p>Description: Engineering Support</p> <p>FY 2016 Accomplishments: Engineering Support of Anti-Jam Development.</p> <p>FY 2017 Plans: Engineering Support of Anti-Jam Development.</p> <p>FY 2018 Base Plans:</p>	2.482	2.250	2.419	-	2.419

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) S36 / Precision Guidance Kit
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Engineering Support of Anti-Jam Development.					
Title: Continue Development/Operational Testing	-	-	0.840	-	0.840
Description: Development/Operational Test					
FY 2018 Base Plans: Execute PGK anti-jam concept and subsystem development and maturation. Perform System Design Review as an entry point into Prototype development and testing.					
Accomplishments/Planned Programs Subtotals	9.153	15.957	14.809	-	14.809

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
• E99250: Procurement of Ammunition Army: Precision Guidance Kit (PGK)	64.324	64.162	48.340	20.023	68.363	58.760	60.380	67.222	71.542	Continuing	Continuing

Remarks

D. Acquisition Strategy
The Precision Guidance Kit (PGK) is a Global Positioning System (GPS) guidance kit with fuzing functions for 155mm High Explosive (HE) artillery projectiles. PGK provides near precision accuracy and effectiveness for 155mm HE projectiles. The PGK corrects the inherent errors associated with ballistic firing solutions and reduces the number of artillery projectiles required to execute the mission. The current PGK Increment has been qualified for the M795 and M549A1 HE projectiles. This increment of PGK entered Low Rate Initial Production (LRIP) at Milestone C in March 2013. Initial Operational Test and Evaluation (IOT&E) was completed 3Q FY 2015, Full Material Release (FMR) was approved 1Q FY 2016, Full Rate Production (FRP) decision and Initial Operational Capability (IOC) occurred 2Q FY 2016. On going PGK Modernization efforts are focused on addressing performance in a GPS degraded environment as well as compatibility with the Army's new long range 155mm cannon and projectile which are scheduled to be fielded in the same timeframe as the next increment of PGK. The strategy includes competitive DOTC concept development efforts with multiple contractors in FY 2017, followed by a DOTC Risk Reduction concept maturation phase in FY 2018. This will be followed by a competitive FAR Based EMD effort beginning in FY 2019.

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 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) S36 / Precision Guidance Kit
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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			
PGK TD Contract	C/CPAF	Alliant Techsystems (ATK) : Plymouth, MN	5.279	-		-		-		-		-	0.000	5.279	5.279
PGK TD Contract	C/CPAF	BAE Systems : Minneapolis, MN	3.103	-		-		-		-		-	0.000	3.103	3.103
Soft Recovery Modules	MIPR	SubSystems Technology : Rosslyn, VA	0.116	-		-		-		-		-	0.000	0.116	0.116
PGK EMD & Phase 1-2 (Reliability Failure/Root Cause Analysis)	C/CPAF	Orbital-Alliant Techsystems (O-ATK) : Plymouth, MN	59.953	-		-		-		-		-	0.000	59.953	53.947
PGK EMD - Phase 3a to 5	C/FFP	Orbital-Alliant Techsystems (O-ATK) : Plymouth, MN	32.443	-		-		-		-		-	0.000	32.443	25.117
High Angle Software Configuration	C/CPFF	Raytheon : Ft Wayne, IN	0.105	-		-		-		-		-	0.000	0.105	0.105
Engineering & Technology Assessment. Low Cost Roll Control Solutions	C/CPFF	DoD Ordnance Technology Consortium (DOTC) - General Dynamics Ordnance & Tactical Systems : Bothell, WA	3.996	0.778	Aug 2016	-		-		-		-	0.000	4.774	2.093
Engineering & Technology Assessment. Low Cost Course Correction solutions.	C/CPFF	BAE Systems/ Rokar : Minneapolis, MN	1.000	0.778	Aug 2016	-		-		-		-	0.000	1.778	0.500
DOTC - PGK GPS Anti-Jam Development - Raytheon	MIPR	DoD Ordnance Technology Consortium (DOTC) - Raytheon : Ft Wayne, IN	0.500	0.778	Jul 2016	-		-		-		-	0.000	1.278	0.000
DOTC - PGK GPS Anti-Jam Development - O-ATK	MIPR	DoD Ordnance Technology Consortium (DOTC)	3.987	2.768	Feb 2016	-		-		-		-	0.000	6.755	0.000

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) S36 / Precision Guidance Kit
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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			
		- Orbital-Alliant Techsystems (O-ATK) : Plymouth, MN													
DOTC - PGK GPS Anti-Jam Development - Rockwell Collins	MIPR	DoD Ordnance Technology Consortium (DOTC) - Rockwell Collins : Cedar Rapids, IA	0.000	0.778	Aug 2016	-		-		-		-	0.000	0.778	0.000
DOTC - PGK GPS Anti-Jam Development	C/CPFF	TBD : Various	0.000	-		12.773	Apr 2017	11.580	Apr 2018	-		11.580	0.000	24.353	40.025
Subtotal			110.482	5.880		12.773		11.580		-		11.580	0.000	140.715	130.285

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			
Program Management Office	Various	Office of the Project Manager (PM) Combat Ammunition Systems (CAS) : Picatinny Arsenal, NJ	11.520	1.277	Jan 2016	0.837	Jan 2017	0.739	Feb 2018	-		0.739	0.000	14.373	12.764
Government Engineering Support	MIPR	Armament Research, Development and Engineering Center (ARDEC) : Picatinny Arsenal, NJ	28.818	1.909	Jan 2016	2.243	Jan 2017	1.600	Jan 2018	-		1.600	0.000	34.570	31.798
Management Support	MIPR	Camber : Mt Arlington, NJ	1.936	-		0.104	Jun 2017	0.050	Jun 2018	-		0.050	0.000	2.090	1.936
Miscellaneous Support Contract	MIPR	MITRE Corporation : Fort Monmouth, NJ	0.600	-		-		-		-		-	0.000	0.600	0.000
Jammer Support	MIPR	Electronic Proving Ground (EPG) : Ft Huachuca, AZ	0.316	-		-		-		-		-	0.000	0.316	0.476

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) S36 / Precision Guidance Kit
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Support (\$ in Millions)				FY 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			
PGK Parallel Studies and Analysis Support	MIPR	Command and Control Directorate : Ft Monmouth, NJ	0.300	-		-		-		-		-	0.000	0.300	0.000
LNO Support - Ft. Sill	MIPR	US ARMY Field Artillery Center : Ft. Sill, OK	0.130	0.071	Jun 2016	-		-		-		-	0.000	0.201	0.180
ATEC Support	MIPR	Army Test and Evaluation Command (ATEC) : Aberdeen, MD	0.025	0.016	Sep 2016	-		-		-		-	0.000	0.041	0.025
Subtotal			43.645	3.273		3.184		2.389		-		2.389	0.000	52.491	47.179

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 Development Testing Increment 1	MIPR	Army Test and Evaluation Command (ATEC) Yuma Proving Ground (YPG) : Yuma, AZ	10.442	-		-		-		-		-	0.000	10.442	10.442
Other Development Testing	MIPR	Various : Various	1.769	-		-		-		-		-	0.000	1.769	1.769
Limited User Test	MIPR	Army Test and Evaluation Command (ATEC) Yuma Proving Ground (YPG) : Yuma, AZ	1.631	-		-		-		-		-	0.000	1.631	1.631
Initial Operational Test & Evaluation - Increment 1	MIPR	Army Test and Evaluation Command (ATEC) Yuma Proving	1.000	-		-		-		-		-	0.000	1.000	1.000

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) S36 / Precision Guidance Kit
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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			
		Ground (YPG) : Yuma, AZ													
Initial Operational Test & Evaluation - Troop Support	MIPR	Lab Test Center : Ft. Sill, OK	0.731	-		-		-		-		-	0.000	0.731	0.731
Component Air Gun/ Railgun Testing	MIPR	Armament Research, Development and Engineering Center (ARDEC) : Picatinny Arsenal, NJ	0.337	-		-		-		-		-	0.000	0.337	0.337
Cold Region Testing	MIPR	Cold Region Test Center : Yuma, AZ	0.300	-		-		-		-		-	0.000	0.300	0.300
Airdrop Testing	MIPR	Army Test and Evaluation Command (ATEC) Yuma Proving Ground (YPG) : Yuma, AZ	0.200	-		-		-		-		-	0.000	0.200	0.200
Development Testing for GPS Anti-Jam	MIPR	Army Test and Evaluation Command (ATEC) Yuma Proving Ground (YPG) : Yuma, AZ	0.590	-		-		0.840	May 2018	-		0.840	0.000	1.430	1.840
Subtotal			17.000	-		-		0.840		-		0.840	0.000	17.840	18.250

	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	171.127	9.153	15.957	14.809	-	14.809	0.000	211.046	195.714

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) S36 / Precision Guidance Kit
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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) Full Materiel Release (FMR)	▲ FMR				▲ IOC				▲ FRP				▲ SFR				▲ PDR				▲ CDR				▲ AJ / Qualification			
(2) Initial Operational Capability (IOC)																												
(3) Full Rate Production (FRP)																												
Anti-Jam / Concept Development	AJ / Concept Development				AJ / Concept Maturation				AJ / Prototype Development and Testing				AJ / Contractor Verification Testing				AJ / Qualification											
(4) Anti-Jam / System Functional Review (SFR)	AJ / Concept Development				AJ / Concept Maturation				AJ / Prototype Development and Testing				AJ / Contractor Verification Testing				AJ / Qualification											
Anti-Jam / Concept Maturation	AJ / Concept Development				AJ / Concept Maturation				AJ / Prototype Development and Testing				AJ / Contractor Verification Testing				AJ / Qualification											
(5) Anti-Jam / System Design Review (SDR)	AJ / Concept Development				AJ / Concept Maturation				AJ / Prototype Development and Testing				AJ / Contractor Verification Testing				AJ / Qualification											
Anti-Jam / Prototype Development and Testing	AJ / Concept Development				AJ / Concept Maturation				AJ / Prototype Development and Testing				AJ / Contractor Verification Testing				AJ / Qualification											
(6) Anti-Jam / Preliminary Design Review (PDR)	AJ / Concept Development				AJ / Concept Maturation				AJ / Prototype Development and Testing				AJ / Contractor Verification Testing				AJ / Qualification											
(7) Anti-Jam / Critical Design Review (CDR)	AJ / Concept Development				AJ / Concept Maturation				AJ / Prototype Development and Testing				AJ / Contractor Verification Testing				AJ / Qualification											
Anti-Jam / Contractor Verification Testing	AJ / Concept Development				AJ / Concept Maturation				AJ / Prototype Development and Testing				AJ / Contractor Verification Testing				AJ / Qualification											
Anti-Jam / Qualification Testing	AJ / Concept Development				AJ / Concept Maturation				AJ / Prototype Development and Testing				AJ / Contractor Verification Testing				AJ / Qualification											

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604802A / Weapons and Munitions - Eng Dev	Project (Number/Name) S36 / Precision Guidance Kit

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Full Materiel Release (FMR)	2	2016	2	2016
Initial Operational Capability (IOC)	2	2016	2	2016
Full Rate Production (FRP)	3	2016	3	2016
Anti-Jam / Concept Development	1	2017	3	2017
Anti-Jam / System Functional Review (SFR)	3	2017	3	2017
Anti-Jam / Concept Maturation	4	2017	4	2018
Anti-Jam / System Design Review (SDR)	4	2018	4	2018
Anti-Jam / Prototype Development and Testing	2	2019	4	2020
Anti-Jam / Preliminary Design Review (PDR)	3	2019	3	2019
Anti-Jam / Critical Design Review (CDR)	1	2021	1	2021
Anti-Jam / Contractor Verification Testing	2	2021	3	2022
Anti-Jam / Qualification Testing	3	2022	4	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 5: System Development & Demonstration (SDD)					PE 0604804A / Logistics and Engineer Equipment - Eng 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
Total Program Element	-	43.229	75.098	90.965	-	90.965	109.672	130.022	60.567	60.632	Continuing	Continuing
194: Engine Driven Gen Ed	-	5.257	13.676	12.890	-	12.890	14.689	8.099	2.588	8.449	Continuing	Continuing
EC9: Contingency Basing Infrastructure	-	3.795	3.609	3.946	-	3.946	3.947	3.958	4.011	3.955	Continuing	Continuing
EJ9: Manuever Support Vessel - Light (MSV-L)	-	9.667	18.338	28.906	-	28.906	37.457	20.554	7.113	0.000	0.000	122.035
FG4: Ultra-Lightweight Camouflage Net System (ULCANS)	-	0.000	0.000	2.972	-	2.972	2.474	2.226	1.484	5.922	Continuing	Continuing
H01: Combat Engineer Eq Ed	-	0.791	2.280	3.889	-	3.889	3.564	2.971	4.948	6.000	Continuing	Continuing
H02: Tactical Bridging - Engineering Development	-	9.407	14.245	14.923	-	14.923	17.315	67.530	14.477	13.000	Continuing	Continuing
H14: Materials Handling Equipment - Ed	-	0.603	0.960	0.745	-	0.745	0.625	0.636	0.641	0.565	Continuing	Continuing
L39: Field Sustainment Support Ed	-	2.552	3.712	3.147	-	3.147	2.247	3.009	3.088	3.183	Continuing	Continuing
L41: Water And Petroleum Distribution - Ed	-	3.228	8.363	8.005	-	8.005	14.468	9.510	9.581	9.697	Continuing	Continuing
L43: ENGINEER SUPPORT EQUIPMENT - ED	-	0.836	2.445	3.795	-	3.795	1.750	1.056	3.381	0.200	Continuing	Continuing
L46: Maintenance Support Equipment	-	1.021	1.886	2.053	-	2.053	1.885	1.919	1.970	1.851	Continuing	Continuing
L47: Improved Environmental Control Units Ed	-	0.726	1.259	1.951	-	1.951	3.827	2.177	2.232	2.295	Continuing	Continuing
VR7: Combat Service Support Systems	-	5.346	4.325	3.743	-	3.743	5.424	6.377	5.053	5.515	Continuing	Continuing

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>
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Note
The FY 2017 funding request was increased \$33.400 million to account for the increases in the following programs: 194 Engine Driven Gen Ed, EJ9 Maneuver Support Vessel, H02 Tactical Bridging - Eng Dev., L41 Water and Petroleum Distribution and VR7 Combat Service Support Systems.

A. Mission Description and Budget Item Justification

This Program Element (PE) provides system development and demonstration for various projects. This PE includes the development of water craft, military tactical bridging, material handling equipment, construction equipment, engineer support equipment, soldier support equipment (to include shelter systems, environmental control, field service equipment, camouflage systems and aerial delivery equipment), water purification equipment, petroleum distribution equipment, and mobile electric power.

<u>B. Program Change Summary (\$ in Millions)</u>	<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	46.039	75.098	81.745	-	81.745
Current President's Budget	43.229	75.098	90.965	-	90.965
Total Adjustments	-2.810	0.000	9.220	-	9.220
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-1.108	-			
• SBIR/STTR Transfer	-1.702	-			
• Adjustments to Budget Years	0.000	0.000	3.216	-	3.216
• Other Adjustments 1	0.000	0.000	6.000	-	6.000
• Other Adjustments 2	0.000	0.000	0.004	-	0.004

Change Summary Explanation

Program increase between the FY 2017 PB and the FY 2018 PB are attributable to increases in the following projects:

- EC9 Contingency Basing Infrastructure
- EJ9 Maneuver Support Vessel -Light (MSV-L)
- FG4 Ultra-Lightweight Camouflage Net System (ULCANS)
- H01 Combat Engineer Eq Ed
- H14 Materials Handling Equipment - Ed
- L39 Field Sustainment Support Ed
- L41 Water And Petroleum Distribution - Ed
- L43 ENGINEER SUPPORT EQUIPMENT - ED
- L46 Maintenance Support Equipment

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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 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	
-L47 Improved Environmental Control Units Ed		

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev				Project (Number/Name) 194 / Engine Driven Gen Ed			
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
194: Engine Driven Gen Ed	-	5.257	13.676	12.890	-	12.890	14.689	8.099	2.588	8.449	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Management and Distribution Control (MDC), previously named Improved Power Distribution Illumination Systems Electrical (IPDISE), funds in this project line are a realignment of funds from 0603804A Project G-11, due to the program transitioning into the Engineering and Manufacturing Development (EMD) Phase.

A. Mission Description and Budget Item Justification

This project supports the Tactical Electric Power (TEP) program which is established to develop a Modernized, Standard Family of Mobile Electric Power (MEP) systems to include MEP Generating Sources (MEPGS) and MEP Distribution Systems (MEPDS) for all Services throughout the Department of Defense. Building on the device/component evaluations conducted in PE 0603804A project G11, this project supports the system development and demonstration of a series of innovative mobile electric power systems that are essential to the development and eventual fielding of modernized MEPGS and MEPDS. These sources will ensure compliance with federally mandated environmental statutes and significantly lower noise and thermal signatures (thereby improving battlefield survivability), improve fuel and electrical efficiency, reduce weight, enhance portability, improve reliability, availability and maintainability, and reduce operational and support costs. FY17 funds will continue to develop the Management and Distribution Control (MDC) Microgrids performance specification to include developmental testing and the Prime Power Connection Kit (PPCK); and complete the Large Advanced Mobile Power Sources (LAMPS) EMD phase. Funding in FY18 will close out the LAMPS EMD phase; continue MDC Power Distribution Unit (PDU), PPCK EMD phase, and 20 Amp (3kW) power distribution.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Large Advanced Mobile Power Sources (LAMPS) and Management and Distribution Control (MDC)/ Microgrids Engineering & Manufacturing Development (EMD) Phase.	5.257	4.896	12.890	-	12.890
Description: Prepare LAMPS and MDC/Microgrids performance specification and begin EMD Phase					
FY 2016 Accomplishments: Continued EMD Phase of LAMPS. Continued EMD Phase of MDC PDU (microgrid).					
FY 2017 Plans: Continue EMD Phase of LAMPS. Continue EMD Phase of MDC PDU (microgrid)					
FY 2018 Base Plans: Begin EMD phase for PPCK and continue EMD Phase of MDC PDU (microgrid).					
Title: Small Tactical Electric Power (STEP) Engineering & Manufacturing Development (EMD) Phase	-	8.780	-	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) 194 / <i>Engine Driven Gen Ed</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Description: Begin EMD Phase for the STEP program.					
FY 2017 Plans: Begin EMD for the STEP program. STEP EMD will be separated into 2 phases: Phase I is System Development with prototype testing with multiple vendors, Phase II will down select to a single vendor for System Demonstration and logistical development.					
Accomplishments/Planned Programs Subtotals	5.257	13.676	12.890	-	12.890

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
• 643804.G11: <i>Logistics and Engineer Equipment - Adv Dev G11</i>	8.525	6.166	6.524	-	6.524	8.183	8.338	7.822	8.040	Continuing	Continuing
• MA9800: <i>Generators and Associated Equipment</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

LAMPS (Large Advanced Mobile Power Sources) Engineering & Manufacturing Development (EMD) Phase: A single competitive contract was awarded for the LAMPS EMD Phase. The EMD phase will be a Fixed Price Incentive-Firm Target (FPI-FT) contract. The EMD contract will require the vendor to integrate components and fabricate prototypes, verify prototype performance through contractor testing, deliver production representative generator sets and conduct Instructor and Key Personnel Training (I&KPT) for Government testing. Major data deliverables will include the Technical Data Package (TDP), provisioning data, logistics management information, technical manuals, test reports and cost data reporting. The Government will purchase the TDP from the vendor with the intent of using it in future competitive re-procurements for LAMPS. A Failure Mode, Effects and Criticality Analysis (FMECA), Level of Repair Analysis (LORA), Functional Configuration Audit (FCA) and a Physical Configuration Audit (PCA) will be completed to verify that the TDP accurately describes the qualified production sets.

The Management and Distribution Control (MDC) program effort will use a multi-phase acquisition strategy, continue to consolidate requirements and provide solutions to known capability gaps. The MDC product line will include a Power Distribution Unit (PDU) designed to interface with the Advanced Medium Mobile Power Sources (AMMPS) automatic power plant/microgrid, the PDU being developed in conjunction with the LAMPS program, the Prime Power Connection Kit (PPCK) and other products to provide the full range of power distribution equipment to support present and future Joint power system requirements.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) 194 / <i>Engine Driven Gen Ed</i>

<u>E. Performance Metrics</u> 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 / 5				PE 0604804A / Logistics and Engineer Equipment - Eng Dev				194 / Engine Driven Gen Ed							
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
Small Tactical Electric Power (STEP)	Various	PM E2S2 : Stafford, VA	0.000	-		0.561		-		-		-	Continuing	Continuing	Continuing
Management and Distribution Control (MDC)/ Microgrids	Various	PM E2S2 : Ft. Belvoir	0.000	-		1.275		1.332	Dec 2017	-		1.332	Continuing	Continuing	Continuing
Subtotal			0.000	-		1.836		1.332		-		1.332	-	-	-
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
Management and Distribution Control (MDC)/ Microgrids	C/CPFF	TBD : TBD	0.000	-		1.750		6.260	Jan 2018	-		6.260	Continuing	Continuing	Continuing
Large Advanced Mobile Power Sources (LAMPS) (100-200kW)	C/FPIF	L-3 Communications, Westwood Corporation, Tulsa, OK : Various	32.427	3.797		-		-		-		-	Continuing	Continuing	Continuing
Small Tactical Electric Power (STEP)	C/CPFF	TBD : TBD	0.000	-		8.780		-		-		-	Continuing	Continuing	Continuing
Subtotal			32.427	3.797		10.530		6.260		-		6.260	-	-	-
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
Large Advanced Mobile Power Sources (LAMPS) (100-200kW)	MIPR	CECOM LCMC : Aberdeen Proving Ground (APG), MD	3.485	-		-		-		-		-	Continuing	Continuing	Continuing
Management and Distribution Control (MDC)/ Microgrids	Various	Various : Various	0.000	-		-		2.168	Dec 2017	-		2.168	0.000	2.168	0.000

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) 194 / <i>Engine Driven Gen Ed</i>
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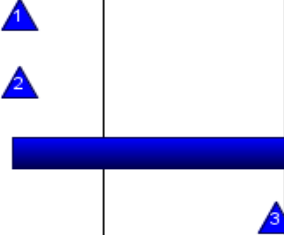
Event Name	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
LAMPS (Large Advanced Mobile Power Sources)																												
EMD - LAMPS																												
DT/Log Demo/OT																												
(1) MS C-LAMPS																												
MDC (Management and Distribution Control)																												
(2) MDD - MDC																												
(3) MDC - Milestone B																												
MDC - PPCK																												
(4) MDC - PPCK Milestone C																												
MDC -3kW (M20) EMD																												
(5) MDC -3kW (M20) Milestone C																												
MDC - AMMPS PDU EMD																												
(6) MDC - AMMPS PDU Milestone C																												

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) 194 / <i>Engine Driven Gen Ed</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
Small Tactical Electric Power (STEP)																												
(1) Milestone B - STEP																												
(2) EMD Award - STEP																												
EMD - STEP																												
(3) Milestone C- STEP																												



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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) 194 / <i>Engine Driven Gen Ed</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
LAMPS (Large Advanced Mobile Power Sources)	1	2016	3	2017
EMD - LAMPS	1	2016	2	2018
DT/Log Demo/OT	1	2016	4	2017
MS C-LAMPS	2	2018	2	2018
MDC (Management and Distribution Control)	3	2017	4	2022
MDD - MDC	3	2017	3	2017
MDC - Milestone B	4	2017	4	2017
MDC - PPCK	4	2017	1	2019
MDC - PPCK Milestone C	1	2019	1	2019
MDC -3kW (M20) EMD	3	2019	4	2020
MDC -3kW (M20) Milestone C	4	2020	4	2020
MDC - AMMPS PDU EMD	2	2021	3	2022
MDC - AMMPS PDU Milestone C	3	2022	3	2022
Small Tactical Electric Power (STEP)	3	2021	4	2022
Milestone B - STEP	3	2021	3	2021
EMD Award - STEP	3	2021	3	2021
EMD - STEP	3	2021	4	2022
Milestone C- STEP	4	2022	4	2022

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>					Project (Number/Name) EC9 / <i>Contingency Basing Infrastructure</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
EC9: <i>Contingency Basing Infrastructure</i>	-	3.795	3.609	3.946	-	3.946	3.947	3.958	4.011	3.955	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project develops the tools and processes that will optimize recommendations for the materiel used to establish, operate, and maintain contingency bases. The project will increase the available knowledge at the base level and provide an analytical foundation for sound investment decision making. The continuous improvement modeling and simulation analysis tools will match the evolution of threats and technologies. Using a system of systems engineering approach, the Contingency Base Infrastructure Product Directorate's focus ensures optimum integration of materiel across the base camp to facilitate the maximizing of Warfighter effectiveness. CBI's analytical results will allow leadership to make data driven, informed decisions on the acquisition and employment/deployment of equipment. This enables contingency bases to be established, operated and managed as a system (system of systems) and the equipment acquired for the base to be compatible and efficient while providing the maximum overall support to the Warfighter. This approach supports Program(s) of Record (PORs) to maximize improvements in Operational Energy and ensures efficiencies across all Areas of Responsibility (AOR).

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Toolset Development	0.797	0.780	0.738	-	0.738
Description: Funding is provided for the following effort.					
FY 2016 Accomplishments: Continued model based systems engineering tool maturation of multiple analytical tools, Base Camp Master Planning Tool – Contingency Base Interface to the Warfighter (CBIWar), and conducted Integrated Design Review #1.					
FY 2017 Plans: Funding is planned to support Developmental Toolset Demonstration (Demo 3) and Operational Toolset Demonstration (Demo 4) that will support portfolio maturation, integration and analytical evaluation. Additionally, providing analysis to the FY21 contingency basing infrastructure equipment set to support Army investment decisions for POM 20-24.					
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 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) EC9 / <i>Contingency Basing Infrastructure</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continue model based systems engineering tool maturation of multiple analytical tools, Base Camp Master Planning Tool – Contingency Base Interface to the Warfighter (CBIWar), an initial transfer of systems data to the Joint Construction Management System (JCMS), and perform an Initial Operational Capability (IOC) review).					
<p>Title: Integrated Analysis and Design</p> <p>Description: Funding is provided for the following effort.</p> <p>FY 2016 Accomplishments: Funding supported the Integrated Toolset Demonstration (Demo 2) that supports portfolio maturation, integration and analytical evaluation. Additionally, this funding provided analysis to the FY20 contingency basing infrastructure core equipment set to support PD CBI's Annual Report which will be used to establish format and content for Army Program Managers and other decision makers on POM funding considerations.. Funding also supported analysis to Current Operations to Combatant Commanders.</p> <p>FY 2017 Plans: Funding is planned to support Developmental Toolset Demonstration and Operational Toolset Demonstration that will support portfolio maturation, integration and analytical evaluation. Additionally, support Army investment decisions across the Contingency Base Infrastructure portfolio.</p> <p>FY 2018 Base Plans: Funding is planned to support Initial Operational Capability of our toolset that will support portfolio maturation, integration and analytical evaluation. Additionally, providing analysis to the FY22 contingency basing infrastructure enhanced equipment set to support PD CBI's Annual Report which will inform Army Project Managers and other decision makers the resource implications of their respective product lines and provide investment recommendations for POM 21-25.</p>	1.730	1.391	1.652	-	1.652
<p>Title: Capabilities Implementation and Materiel Requirements</p> <p>Description: Funding is provided for the following effort.</p> <p>FY 2016 Accomplishments: Funding supported the development of the design of different sized contingency base camps, core capability sets, and establishment of a configuration management plan to manage the base camp capability sets. Funding also provided support to Current Operations to Combatant Commanders.</p> <p>FY 2017 Plans:</p>	0.489	0.613	0.673	-	0.673

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) EC9 / <i>Contingency Basing Infrastructure</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Funding is planned to continue supporting the development of the design of different sized contingency base camps, capability sets, expansion and enhancements sets, and establishment of a configuration management plan to manage the base camp capability sets. FY 2018 Base Plans: Funding is planned to continue supporting the development of the design of different sized contingency base camps, capability sets specifically focusing on enhancement sets, and establishment of a configuration management plan to manage the base camp capability sets.					
Title: Program Management Description: Funding is provided for the following effort. FY 2016 Accomplishments: Oversight and management of integrated analysis and design, capabilities implementation and materiel requirements, and toolset development. Funding supported managing cost, schedule, performance, risk, personnel, and operational activities. Also oversight, analysis and management of operational energy related impacts and technology gaps. Supported development of Army Regulation for Contingency Basing. FY 2017 Plans: Oversight and management of integrated analysis and design, capabilities implementation and materiel requirements, and toolset development. Funding to support managing cost, schedule, performance, risk, personnel, and operational activities. Also oversight, analysis and management of operational energy related impacts and technology gaps. FY 2018 Base Plans: Oversight and management of integrated analysis and design, capabilities implementation and materiel requirements, and toolset development. Funding to support managing cost, schedule, performance, risk, personnel, and operational activities. Also oversight, analysis and management of operational energy related impacts and technology gaps. Funding will continue to support the review and staffing of the Joint Publication for Contingency Basing.	0.779	0.825	0.883	-	0.883
Accomplishments/Planned Programs Subtotals	3.795	3.609	3.946	-	3.946

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 / 5	R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev	Project (Number/Name) EC9 / Contingency Basing Infrastructure

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

Remarks

D. Acquisition Strategy

Not applicable for this item.

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 / 5					R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev					Project (Number/Name) EJ9 / Maneuver Support Vessel -Light (MSV-L)		
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
EJ9: Maneuver Support Vessel - Light (MSV-L)	-	9.667	18.338	28.906	-	28.906	37.457	20.554	7.113	0.000	0.000	122.035
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Maneuver Support Vessel (Light) (MSV(L)), New Start in FY16.

A. Mission Description and Budget Item Justification

The Maneuver Support Vessel (Light) (MSV(L)) program element supports the Engineering and Manufacturing Development (EMD) phase of the program. The MSV(L) is a multifunctional waterborne mobility platform, which displaces the current Landing Craft Mechanized-8 (LCM-8) with greater capabilities in the areas of payload, speed, and functional draft (shallower water). This vessel also provides new roll-through capability via stern access and bow ramps. The MSV(L) provides a waterborne corridor for movement and maneuver; expeditionary delivery of combat configured equipment, troops, and logistics, in austere anti-access/area denial environments; and operational capability from ship to shore and along coastal waters, narrow inland water ways, and rivers. This vessels capability supports transporting multiple combat configured ready-to-fight payloads with crew (i.e. an Abrams tank; or two Strykers with bar armor; or four Joint Light Tactical Vehicles (JLTVs); or two 20 ft. or one 40 ft. ISO container (Intermodal container); or a Heavy Expandable Mobility Tactical Truck (HEMTT); or a Load Handling System (LHS), and trailer). The MSV(L) provides the capability to operate fully loaded at a speed of 15 knots in Beaufort Sea Scale 3 conditions, while being survivable (seaworthy) in Beaufort Sea Scale 7 conditions. The vessels force protection attributes includes a subsurface surveillance device for obstacle detection and avoidance, protection from small arms fire, and two Common Remotely Operated Weapon Stations (CROWS II) for vessel defense, and the capacity to mitigate detection through reduction of thermal and acoustic signature. The MSV(L) provides increased capability that moves combat configured forces and supplies more efficiently than the LCM-8.

FY18 funding will primarily support maturation of the contractor's design, start of full scale prototype build, and potentially enable program acceleration.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Program Management / Systems Engineering	5.470	3.824	3.977	-	3.977
Description: PM/Matrix Support includes PM and systems engineering oversight required to manage the program and provide contractor oversight. Salaries for core and matrix support for development and approval of MSV(L) Milestone B (MS B).					
FY 2016 Accomplishments:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) EJ9 / <i>Manuever Support Vessel -Light (MSV-L)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Salaries for Core and Matrix Support resulted in the posting of the Request for Proposal (RFP). The funding of the Source Selection Evaluation Board (SSEB) uses primarily FY16 funds. Current labor estimate of \$2.4M covers salaries through end of Jun 17. The SSEB commenced in Jan 17 and is estimated to last 6-8 months. FY 2017 Plans: 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 professional acquisition workforce. FY 2018 Base Plans: Funds will cover salaries for Core and Matrix support, contract execution, program management and contractor oversight.					
Title: Naval Architecture Support Description: Naval architecture support and travel expenses. FY 2016 Accomplishments: Developed the Army Technical Program Description (ATPD) for the Request For Proposal (RFP). FY 2017 Plans: 2.5 man years to provide Naval architecture support for the MSV(L) program to include travel expenses. FY 2018 Base Plans: Naval Architecture to support MSV(L) contract execution.	0.110	0.631	0.650	-	0.650
Title: Program Management Support Contract Description: Program Management and Contract Support for MSV(L). FY 2016 Accomplishments: Program Management Support of contract support for MSV(L) assisted with program documentation to support RFP and Milestone B (MS B). This also includes the Contract Date Requirements List (CDRL) module which aids in the contract deliverable management. FY 2017 Plans: Salary and travel expenses for 2 man years for Scheduler and Project Office support on MSV(L). FY 2018 Base Plans:	1.421	0.507	0.750	-	0.750

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) EJ9 / <i>Manuever Support Vessel -Light (MSV-L)</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Program Management Support to support MSV(L) contract execution.					
Title: Government Furnished Equipment (GFE) Description: GFE for prototype vessel consist of Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR). FY 2016 Accomplishments: Requisitioning GFE to support fabrication of the Contractor Systems Integration Laboratory (CSIL) during EMD. FY 2018 Base Plans: GFE is required to support the full size prototype vessel.	1.029	-	1.000	-	1.000
Title: Engineering and Manufacturing Development (EMD) Contract Description: The EMD phase of the contract includes system engineering and analysis to support execution of the Preliminary Design Review (PDR), Critical Design Review (CDR), CSIL fabrication, model basin testing, production of full-scale prototype vessel and required testing. In addition, deliverables include development of Integrated Product Support (IPS) analysis and products, as well as, development of Technical Data Package (TDP). FY 2017 Plans: EMD contract FY 2018 Base Plans: FY18 will include system engineering analysis to support execution of the Critical Design Review (CDR), completion and testing of CSIL, model basin testing, and authorization for the production of full-scale prototype vessel. The funding increase in FY18 is a result of cost associated with the build of the MSV(L) full-scale prototype. The current schedule is an estimate. Schedule revisions will occur after contract award which may include acceleration in the program if FY17 and FY18 funding remains intact.	-	13.058	22.039	-	22.039
Title: Government Test and Evaluation Support Description: Government test support. FY 2017 Plans:	-	0.318	0.490	-	0.490

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) EJ9 / <i>Manuever Support Vessel -Light (MSV-L)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Government test support. FY 2018 Base Plans: Government oversight of model basin and CSIL testing.					
Title: Information Support Plan (ISP) Description: The ISP is a required document for the MSV(L) at MS B. An ISP is required for all Acquisition Category (ACAT) programs with systems that connect in any way to the communications and information infrastructure including both Information Technology (IT) and National Security System (NSS) programs. (DoDI 5000.02, DoDI 8330.01, and JCIDS Manual). FY 2016 Accomplishments: The award of the ISP contract occurred in FY16. The contractor began development of Department of Defense Architecture Framework (DoDAF) views and architecture and informed a draft of the ISP.	1.637	-	-	-	-
Accomplishments/Planned Programs Subtotals	9.667	18.338	28.906	-	28.906

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>
• SSN R03050: <i>MSV Support Vessel (Light) MSV-L SSN R03050</i>	-	-	-	-	-	-	8.241	79.279	84.268	Continuing	Continuing

Remarks
 The MSV(L) is a new start program beginning in FY16. APE 0603804, Project 526 provided resourcing for research and development support to this program prior to the receipt of funding in Feb 16.
 Significant Achievements:
 - The RFP was released on 27 Oct 16 and closed on 30 Jan 17. The SSEB commenced 30 Jan 17.
 - An Army Requirements Oversight Council (AROC) was held 15 Jul 16. The Army Vice Chief of Staff chaired the AROC, approved the Configuration Steering Board (CSB) changes to the Capabilities Development Document (CDD), and concurred on the four year EMD schedule. The CDD was re-staffed and approved on 11 Oct 16.
 - A Request for Information (RFI) was released with an updated Army Technical Purchase Description (ATPD), Statement of Work (SOW), Contract Data Requirements List (CDRLs), and attachments of Government Furnished Information (GFI) on 19 Feb 16. The RFI served as a mini draft RFP.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev	Project (Number/Name) EJ9 / Maneuver Support Vessel -Light (MSV-L)

D. Acquisition Strategy

The MSV(L) will enter at MS B in FY17 with a four year EMD Phase, followed by Low Rate Initial Production (LRIP) and Full Rate Production (FRP). The acquisition strategy is to have a full and open competition with a down select from paper designs to one contractor at MS B. The contract will award one 10 year contract to a single vendor comprised of a 4 year EMD followed by the production and development phase. Model basin testing will occur, after successful execution of PDR. This sequence of events mitigate risks prior to the authorization of building the full size prototype. The full size prototype will undergo testing which will inform the Capability Production Document (CPD). Following MS C approval, the Government will authorize the contractor to initiate LRIP and subsequently FRP.

E. Performance Metrics

At MS B, The Acquisition Program Baseline (APB) will be approved establishing cost, schedule, and performance metrics. Upon contract award, the contractor will provide monthly cost and performance deliverables.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev	Project (Number/Name) EJ9 / Maneuver Support Vessel -Light (MSV-L)
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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			
Engineering and Manufacturing Development (EMD)	C/FP	ACC Warren, MI : Warren, MI	0.000	-		13.058	Mar 2017	22.039	Mar 2018	-		22.039	53.073	88.170	88.820
Government Furnished Equipment (GFE)	Reqn	Various : Various	0.000	1.029	Jan 2017	-		1.000	Mar 2018	-		1.000	0.000	2.029	0.000
Information Support Plan (ISP)	SS/CPFF	ACC Warren, MI : Warren, MI	0.000	1.637	Apr 2016	-		-		-		-	0.000	1.637	2.278
Subtotal			0.000	2.666		13.058		23.039		-		23.039	53.073	91.836	91.098

Remarks
 Due to re-phasing of the EMD phase from 3 to 4 years, RFP release was delayed, which causes the contract award to occur in 4QFY17. GFE in FY16 was to support fabrication of the Contract Systems Integration Laboratory (CSIL) during EMD. FY18 GFE is required to support the full size prototype.

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			
Salaries for Core and Matrix Personnel Army Watercraft, TARDEC, ILSC PSID.	MIPR	Detroit Arsenal : Warren, MI 48397-5000	0.000	5.470	Oct 2015	3.824	Oct 2016	3.977	Oct 2017	-		3.977	Continuing	Continuing	0.000
Salaries/Travel for Naval Architecture Support	C/CPFF	Picatinny Arsenal, New Jersey 07806-5000 : Warren, MI 48397-5000	0.000	0.110	Feb 2016	0.631	Oct 2016	0.650	Oct 2017	-		0.650	0.000	1.391	0.000
Salaries / Travel for Program Management Support	C/CPFF	Picatinny Arsenal, New Jersey 07806-5000 : Warren, MI 48397-5000	0.000	1.421	Nov 2015	0.507	Jul 2017	0.750	Jan 2018	-		0.750	Continuing	Continuing	0.000
Subtotal			0.000	7.001		4.962		5.377		-		5.377	-	-	0.000

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev	Project (Number/Name) EJ9 / Maneuver Support Vessel -Light (MSV-L)
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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			
Test and Evaluation - Government	MIPR	ATEC: APG : APG, MD	0.000	-		0.318	Mar 2017	0.490	Oct 2017	-		0.490	Continuing	Continuing	0.000
Subtotal			0.000	-		0.318		0.490		-		0.490	-	-	0.000
Project Cost Totals			0.000	9.667		18.338		28.906		-		28.906	-	-	91.098

Remarks

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) EJ9 / <i>Maneuver Support Vessel -Light (MSV-L)</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
Salaries for Core, Matrix Support and SSEB																												
(1) Configuration Steering Board (CSB) Held and Approved	▲																											
(2) Industry Day Held	▲																											
(3) Army Requirements Oversight Board (AROC) / CDD Update					▲																							
(4) RFP Released					▲																							
(5) Milestone B					▲																							
(6) Contract Award					▲																							
(7) Preliminary Design Review (PDR)									▲																			
(8) Modeling and Simulation									▲																			
Contractor System Integration Laboratory (CSIL)																												
Model Basin Testing																												
(9) Critical Design Review (CDR)																					▲							
Prototype Build																												

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) EJ9 / <i>Manuever Support Vessel -Light (MSV-L)</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
Prototype Test and Evaluation (includes Subsystem tests) (1) Milestone C - Transition to OPA funding																												



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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) EJ9 / <i>Manuever Support Vessel -Light (MSV-L)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Salaries for Core, Matrix Support and SSEB	1	2016	3	2021
Configuration Steering Board (CSB) Held and Approved	1	2016	1	2016
Industry Day Held	1	2016	1	2016
Army Requirements Oversight Board (AROC) / CDD Update	4	2016	4	2016
RFP Released	1	2017	1	2017
Milestone B	2	2017	2	2017
Contract Award	2	2017	2	2017
Preliminary Design Review (PDR)	2	2018	2	2018
Modeling and Simulation	2	2018	2	2018
Contractor System Integration Laboratory (CSIL)	2	2018	4	2022
Model Basin Testing	3	2018	4	2018
Critical Design Review (CDR)	4	2018	4	2018
Prototype Build	1	2019	2	2020
Prototype Test and Evaluation (includes Subsystem tests)	3	2019	4	2021
Milestone C - Transition to OPA funding	4	2021	4	2021

Note

All Milestones scheduled from contract award to MS C are estimated. Once contract is awarded, the schedule and milestones will be updated. Although contract award was delayed, opportunities exist for program acceleration if program funding remains in place.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev				Project (Number/Name) FG4 / Ultra-Lightweight Camouflage Net System (ULCANS)			
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
FG4: Ultra-Lightweight Camouflage Net System (ULCANS)	-	0.000	0.000	2.972	-	2.972	2.474	2.226	1.484	5.922	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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).

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Ultra-lightweight Camouflage Net System (ULCANS)	-	-	2.972	-	2.972
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).					
FY 2018 Base Plans: Obtain Milestone B decision authorizing ULCANS Increment I to enter Engineering and Manufacturing Development (EMD). Award development contract, procure/build test items for Woodland, Arctic, and Desert Variants and conduct competitive down-select testing to one vendor. Initiate build of Woodland variants test items for Developmental Testing/ Operational Testing (DT/OT).					
Accomplishments/Planned Programs Subtotals	-	-	2.972	-	2.972

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) FG4 / <i>Ultra-Lightweight Camouflage Net System (ULCANS)</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 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>
• 604804VR7: <i>Combat Service Support Systems</i>	5.346	4.325	3.743	-	3.743	5.424	6.377	5.053	5.515	Continuing	Continuing
• 643804VR8: <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

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 / 5					R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev				Project (Number/Name) H01 / Combat Engineer Eq Ed			
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
H01: <i>Combat Engineer Eq Ed</i>	-	0.791	2.280	3.889	-	3.889	3.564	2.971	4.948	6.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the engineering, manufacturing, and development of combat engineer equipment used in support of horizontal and vertical engineer construction tasks, and to develop a variety of enabling systems that will support and improve mobility for Engineers in the Brigade Combat Teams (BCT), Combat Support Brigade (CSB), and Multi-Roll Bridge Company (MRBC) forces. This project also supports the development of enabling systems to meet critical capabilities of joint interdependence through Air and Ground Line of Communication and Rapid Tactical Earthmoving repair and construction which increase the operational reach of modular forces. Systems that support BCT and CSB forces include: High Mobility Engineer Excavators, Scrapers, Scoop Loaders, Skid Steer Loaders, Dozers, Cranes and Graders. Systems that support the MRBC forces include Hydraulic Excavators (HYEX) and Enhanced Rapid Airfield Construction Capability (ERACC).

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Driver Assist	-	1.353	0.453	-	0.453
Description: Research and demonstrate technologies that will enhance operations such as the inclusion of cameras, collision sensors, and lifting aids.					
FY 2017 Plans: Investigate the possibility of transitioning identified technologies onto additional Construction Engineer Equipment platforms such as the T-5 and T-9 Dozer.					
FY 2018 Base Plans: Integrate Commercial-off-the-Shelf (COTS) cameras, similar to backup cameras, and collision warning sensors to increase situational awareness of CE operator. Will result in the production representative prototype on vehicle by end of Fiscal Year 2021. Test and validate additional fork carriages for fielded loaders.					
Title: Operational Efficiency	0.387	-	0.100	-	0.100
Description: Evaluate emerging technologies that can improve machine productivity and efficiency such as baseline fuel efficiency, engine management, efficient lubricants, and hydraulic technologies.					
FY 2016 Accomplishments:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) H01 / <i>Combat Engineer Eq Ed</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Evaluated emerging technologies that can improve machine productivity and efficiency such as baseline fuel efficiency, engine management, efficient lubricants, and hydraulic technologies.</p> <p>FY 2018 Base Plans: Work with TARDEC Force Projection Technology group to test and qualify additional lubricants/hydraulic fluids which increase efficiency and decrease change intervals. Research additional hydraulic control systems which have the potential to increase efficiency of systems. Continue to develop duty cycles for improved efficiencies. Conduct basic research into the possibility of having a hybrid solution developed to integrate into systems already fielded.</p>					
<p>Title: System Engineering/Program Management</p> <p>Description: Provide funding for System Engineering and Program Management support costs.</p> <p>FY 2016 Accomplishments: Provided funding for System Engineering and Program Management support costs.</p> <p>FY 2017 Plans: Program Management Support of R&D Program for CE</p> <p>FY 2018 Base Plans: Provide funding for System Engineering and Program Management support costs.</p>	0.404	0.450	0.450	-	0.450
<p>Title: Technology Insertion/System Improvement</p> <p>Description: Work with Maneuver Support Center of Excellence (MSCoE) to test and integrate hardware to increase platform capability and performance. Develop prototype systems to provide additional machine capability. This may include sweepers, buckets, lift devices, sand-bag filler auger, expandable tines for +48" center load pallets, and fork enhancements.</p> <p>FY 2017 Plans: Investigate the availability and commercial capability of the Family of Skid Steer Loaders (CASE M400 series). These attachments include Rock drill, Angle Boom, Roto-Tiller, Vibratory Roller, Snow Blower, Dozer Blade, Sand Bagger, Backhoe and Bridge Handling Equipment. Specific focus will be on attachments which improve the capability to improve the Rapid Airfield Repair (Vibratory Roller, Roto-tiller, Back-hoe). The Effort may include purchase/lease of hardware and demonstration of capacities which will enhance Rapid Airfield Repair.</p> <p>FY 2018 Base Plans:</p>	-	0.477	0.575	-	0.575

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) H01 / <i>Combat Engineer Eq Ed</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Survey Combat Engineer Equipment fleet to determine what systems have obsolete technology which will not be procurable as spares for the remaining Life Cycles of the systems. Research additional technologies to improve the maintenance and operating efficiencies. Procure and evaluate the commercially available technology to replace aging components which include new engine/hydraulic controllers, joystick controls, lighting, etc. Maintenance improvements can include self-lubrication systems. Integrate and evaluate the improvement in the military environment and assess the benefits to the Soldier. Work with Maneuver Support Center of Excellence (MSCoE) and maintenance personnel to identify systems and what areas of machine maintenance are critical for increasing operational availability.</p>					
<p>Title: Mine Clearing Armor Protection (MCAP)</p> <p>Description: Evaluate and integrate technologies to increase operator protection and safety during mine clearing missions. Mine Clearing Armor Protection (MCAP) Dozers were built on legacy D7G. These systems are being replaced by the D7R and will require additional equipment to allow for use in completing the MCAP mission. This includes providing greater operator protection as well as additional tools for conducting the mine clearing operation.</p> <p>FY 2018 Base Plans: Review the requirements for crew protection and conduct a cost/performance trade off to determine if the best way to protect the operator is to increase the armor protection or remove the operator from the cab. Research blade design to ensure the mine clearing capability is sufficient for meeting the requirement of the MCAP mission.</p>	-	-	1.911	-	1.911
<p>Title: Forced Entry (Airborne/Air Assault) Study/Development</p> <p>Description: Explore options of using Program of Record systems to meet Forced Entry requirements.</p> <p>FY 2018 Base Plans: Conduct feasibility study for an Air Assault version of the 120M Grader which will be capable of being transported by helicopter. This will include provisions for splitting the 120M into multiple parts and reassembly in the field.</p>	-	-	0.200	-	0.200
<p>Title: Weight Reduction in Transparent Armor (TA)</p> <p>Description: Investigate technologies that will reduce the weight in TA while maintaining current protection levels or technologies that will increase protection levels with no or minimal increase in weight.</p>	-	-	0.200	-	0.200

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev	Project (Number/Name) H01 / Combat Engineer Eq Ed

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
FY 2018 Base Plans: Continue the work under the TARDEC TA Small Business Innovative Research (SBIR) program which has already shown positive result to quality TA at the protection level and continue to develop one level higher.					
Accomplishments/Planned Programs Subtotals	0.791	2.280	3.889	-	3.889

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
• R05901: High Mobility Engineer Excavator	2.656	4.643	64.339	1.932	66.271	47.297	28.219	3.600	3.600	Continuing	Continuing
• R03801: Grader, Mtzd, Hvy	5.903	4.789	0.989	-	0.989	-	-	-	-	0.000	11.681
• X01500: Hydraulic Excavator	-	1.123	0.000	3.850	3.850	-	4.068	8.663	7.805	Continuing	Continuing
• M08100: Plant, Asphalt Mixing	0.984	-	-	-	-	-	-	-	-	0	0.984
• M06100: Tractor Full Tracked, Med T-9	27.156	4.426	-	-	-	-	-	-	-	0	31.582
• R06701: All Terrain Cranes	13.415	65.285	8.935	-	8.935	10.535	17.790	32.900	32.685	Continuing	Continuing
• R02800: Scraper, Earthmoving	29.460	26.233	11.180	-	11.180	8.400	-	-	-	0	75.273
• R03001: ERACC IV - Soil Stabilization	2.531	-	-	-	-	-	-	-	-	0	2.531
• R07002: ERACC I Site Assessment And Selection	-	-	-	-	-	-	-	-	-	0	0.000
• R07003: ERACC 2 Enhanced Earthmoving	-	2.779	2.563	-	2.563	0.992	0.991	0.991	3.358	Continuing	Continuing
• R07004: ERACC III Mobile Technical Engineer Lab	-	-	-	-	-	-	-	-	-	0	0.000
• M05500: Const Equip ESP	19.240	26.712	19.032	-	19.032	44.508	37.768	24.313	24.250	Continuing	Continuing

Remarks

D. Acquisition Strategy
Conduct research, development, and investigations on future Construction Equipment (CE) and identify the path forward for programs to be transitioned for Program Executive Officer Program Management. Identify technical advancements that can improve safety, reliability, survivability, transportability, availability, maintainability and reduce the logistical footprints for future CE equipment.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
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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 / 5					R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>				Project (Number/Name) H02 / <i>Tactical Bridging - Engineering 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
H02: <i>Tactical Bridging - Engineering Development</i>	-	9.407	14.245	14.923	-	14.923	17.315	67.530	14.477	13.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Joint Assault Bridge (JAB) will be funded in PE 643804/EW8 for FY18

A. Mission Description and Budget Item Justification

This project supports the engineering and manufacturing development and transition to procurement of Future Force Bridge Systems and support equipment. Funding supports development and testing of the Bridge Supplemental Set (BSS), tests associated with the Low Rate Initial Production (LRIP) phase of the Line of Communication Bridge (LOCB) and Joint Assault Bridge (JAB). This project also funds efforts to upgrade and modernize the Bridging Product Management portfolio through the development of new systems such as the Structural Health Monitoring System, the Family of Higher Military Load Classification (High MLC) Bridges and the M9ACE replacement - Mobile Armored Combat Earthmover (MACE).

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Joint Assault Bridge (JAB) Development and Testing	5.742	8.600	-	-	-
Description: Joint Assault Bridge (JAB) Development and Testing					
FY 2016 Accomplishments: Funding used for EMD prototyping and design/analysis of Life Fire Test plates, commander's station and armor kits for the Joint Assault Bridge (JAB) system.					
FY 2017 Plans: Operational Testing and Live Fire Testing of the Joint Assault Bridge					
Title: Line of Communication Bridge (LOCB) Development and Testing	2.900	-	4.000	-	4.000
Description: Prototype development and developmental and operational testing of the Line of Communication Bridge (LOCB)					
FY 2016 Accomplishments:					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) H02 / <i>Tactical Bridging - Engineering Development</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Funding used for scale model, durability, and fatigue testing as well as connector analysis for the Line of Communication Bridge system FY 2018 Base Plans: Funding supports structural strength testing.					
Title: Structural Health Monitoring System Description: Develop and integrate a passive method to collect mobile military bridge system usage and health data and provide that information back to the user for informed decision making. System is targeted for use on the Joint Assault Bridge (JAB), Rapidly Emplaced Bridging System (REBS), Dry Support Bridge (DSB), and Line of Communication Bridge (LOCB), and will reduce the requirement for in-field inspections. FY 2016 Accomplishments: Funding used for the continued development, design and testing of the Structural Health Monitoring system	0.765	-	-	-	-
Title: Bridge Supplemental Set (BSS) Description: Develop a multi-functional, consolidated engineering set consisting of an anchorage system, access/egress traction improvement matting, power generation, tools, and a float bridge protection device. The BSS is targeted for use with multiple tactical bridging systems to include the Line of Communication Bridge (LOCB), Improved Ribbon Bridge (IRB), and the Dry Support Bridge (DSB). It will also increase the capability of the Multi-Role Bridge Company (MRBC). FY 2017 Plans: FY17 RDTE will fund development of contract documents from User requirements, preparing Request(s) for Proposals, source selection evaluation, and award of development contracts for BSS subsystems. . FY 2018 Base Plans: FY18 RDTE will fund development of contract documents from User requirements, preparing Request(s) for Proposals, source selection evaluation, and award of development contracts for BSS subsystems.	-	5.645	4.000	-	4.000
Title: Mobile Armored Combat Earthmover (MACE) Description: Armored Combat Earthmover Replacement FY 2018 Base Plans:	-	-	0.923	-	0.923

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) H02 / <i>Tactical Bridging - Engineering Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
FY18 funds will support developing an analysis of alternatives for M9 ACE replacement					
Title: Family of Higher Military Load Capacity Bridges	-	-	6.000	-	6.000
Description: The Family of Higher Military Load Classification (MLC) Bridges will develop a family of bridge components and systems to support the heavier weights of next generation combat vehicles.					
FY 2018 Base Plans: FY18 funds will support developing an analysis of alternatives for the Family of Higher MLC Bridges, modeling and simulations, market research and to support MDD approval.					
Accomplishments/Planned Programs Subtotals	9.407	14.245	14.923	-	14.923

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
• OPA-3, G06520: OPA-3, G06520 Bridge Supplemental Set	3.967	0.983	-	-	-	-	-	4.374	4.386	Continuing	Continuing
• WTCV, GZ3001: WTCV, GZ3001 Joint Assault Bridge	33.455	64.752	128.350	-	128.350	165.936	207.660	212.783	263.068	Continuing	Continuing
• OPA-3, MX0100 Tactical Bridging: OPA-3, G82404 Line of Communication Bridge	9.822	13.553	16.610	-	16.610	18.710	18.634	19.447	30.000	Continuing	Continuing

Remarks

D. Acquisition Strategy
Research Development Test & Evaluation efforts to support testing and follow-on production.

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 / 5	R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev	Project (Number/Name) H02 / Tactical Bridging - Engineering Development
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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			
System Engineering and Program Support	MIPR	Various : Various	4.510	0.723	Jan 2016	1.645	Oct 2016	1.800	Oct 2017	-		1.800	Continuing	Continuing	0.000
Subtotal			4.510	0.723		1.645		1.800		-		1.800	-	-	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			
Joint Assault Bridge Development	C/FFP	DRS/GDLS : Saint Louis, MO/Sterling Hts, MI	50.652	0.777		-		-		-		-	Continuing	Continuing	Continuing
Line of Communication Bridge Development	MIPR	Rock Island Arsenal (RIA) : Rock Island, IL	17.495	-		-		0.950	Mar 2018	-		0.950	Continuing	Continuing	Continuing
Bridge Supplemental Set - Anchorage	MIPR	Engineer Research and Development Center : Vicksburg, MS	0.096	-		1.500		0.890	Jan 2018	-		0.890	0.000	2.486	0.000
Bridge Supplemental Set - Bridge Protection Device	MIPR	Engineer Research and Development Center : Vicksburg, MS	0.000	-		0.750		0.335	Jan 2018	-		0.335	0.000	1.085	0.000
Bridge Supplemental Set - Site Stability	MIPR	Engineer Research and Development Center : Vicksburg, MS	0.000	-		1.250		0.773	Jan 2018	-		0.773	0.000	2.023	0.000
Bridge Supplemental Set - Power Generation/Tools	MIPR	PM SKOT : Warren, MI	0.000	-		0.500		0.335	Jan 2018	-		0.335	0.000	0.835	0.000
Structural Health Monitoring	MIPR	TARDEC : Warren, MI	0.850	0.765	Feb 2016	-		-		-		-	0.000	1.615	0.000
Mobile Armored Combat Earthmover Development	MIPR	TBS : TBD	0.000	-		-		0.923	Mar 2018	-		0.923	0.000	0.923	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 / 5				PE 0604804A / Logistics and Engineer Equipment - Eng Dev				H02 / Tactical Bridging - Engineering Development								
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	
Family of High Military Load Capacity Bridges	MIPR	TBS : TBD	0.000	-		-		3.000	Mar 2018	-		3.000	0.000	3.000	0.000	
Subtotal			69.093	1.542		4.000		7.206		-		7.206	-	-	-	
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	
Family of High Military Load Capacity Bridges - Bridge Lab Spt	MIPR	TARDEC - Bridge Lab : Warren, MI	0.000	-		-		0.100	Nov 2017	-		0.100	0.000	0.100	0.000	
Subtotal			0.000	-		-		0.100		-		0.100	0.000	0.100	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	
Joint Assault Bridge Testing	MIPR	Aberdeen Proving Grounds (APG) : APG, Maryland	13.221	4.242	Apr 2016	8.600	Mar 2017	-		-		-	0.000	26.063	0.000	
Line of Communication Bridge Testing	MIPR	TBS : TBD	10.953	2.900	Mar 2016	-		2.727	Feb 2018	-		2.727	Continuing	Continuing	Continuing	
Bridge Supplemental Set - Anchorage	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	0.000	-		-		0.340	Jan 2018	-		0.340	Continuing	Continuing	Continuing	
Bridge Supplemental Set - Bridge Protection Device	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	0.000	-		-		0.350	Jan 2018	-		0.350	Continuing	Continuing	Continuing	
Bridge Supplemental Set - Power Generation/Tools	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	0.000	-		-		0.050	Jan 2018	-		0.050	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 / 5				R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>					Project (Number/Name) H02 / <i>Tactical Bridging - Engineering 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	
Bridge Supplemental Set - Site Stability	MIPR	Aberdeen Proving Ground : Aberdeen, Maryland	0.000	-		-		0.350	Jan 2018	-		0.350	Continuing	Continuing	Continuing	
Family of High Military Load Capacity Bridges Testing	MIPR	TBS : TBD	0.000	-		-		2.000	Mar 2018	-		2.000	Continuing	Continuing	Continuing	
Subtotal			24.174	7.142		8.600		5.817		-		5.817	-	-	-	
			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			97.777	9.407		14.245		14.923		-		14.923	-	-	-	
Remarks																

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev	Project (Number/Name) H02 / Tactical Bridging - Engineering Development
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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 and Testing																																
Joint Assault Bridge Live Fire Test & Eval Armor Development																																
JAB LFT&E Armor Development																																
(1) Joint Assault Bridge Milestone "C"			▲																													
(2) Joint Assault Bridge Low Rate Initial Production			▲																													
(3) Joint Assault Bridge Critical Design Review			▲																													
Joint Assault Bridge Life Fire Test & Eval																																
JAB LFT&E																																
Joint Assault Bridge Production Qualification Test																																
JAB PQT																																
Joint Assault Bridge Developmental Test / Operational Test																																
JAB DT/OT																																
Joint Assault Bridge Initial Operational Test & Eval																																
JAB IOT&E																																
(4) Joint Assault Bridge Full Rate Production																																
JAB FRP																																
Line Of Communication Bridge Development and Testing																																
Line Of Communication Bridge DT&E																																
LOCB DT&E (DRY)																																
Line Of Communication Bridge Durability																																
LOCB Durability																																

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev	Project (Number/Name) H02 / Tactical Bridging - Engineering Development
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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) Line Of Communication Bridge Milestone "C"																	▲ 1 LOCB MS"C" (DRY)																			
Line Of Communication Bridge Log Demo																									■ LOCB Log Demo											
Line Of Communication Bridge IOT&E																													■ LOCB IOT&E							
(2) Line Of Communication Bridge FRPDR																																	▲ 2 LOCB FRPDR			
Bridge Supplemental Set																																				
(3) Bridge Supplemental Set Material Dev Decision					▲ 3 MDD																															
(4) Bridge Supplemental Set MSC - Site Stability									▲ 4 MSC - SS																											
(5) Bridge Supplemental Set - Site Stability - Contract Award									▲ 5 Contract Award - SS																											
Bridge Supplemental Set - Site Stability - Product Qualification Testi													■ PQT - SS																							
(6) Bridge Supplemental Set MSB - Bridge Protection Device																	▲ 6 MSB - BPD																			
(7) Bridge Supplemental Set - Bridge Protection Device - Make or Bu					▲ 7 MBD - BPD																															
Bridge Supplemental Set - Bridge Protection Device - Developmental													■ DT - BPD																							
(8) Bridge Supplemental Set MSB - Anchorage																	▲ 8 MSB - Anchor																			

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


Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev	Project (Number/Name) H02 / Tactical Bridging - Engineering Development
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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) Bridge Supplemental Set - Anchorage - Make or Buy Decision					▲ MBD - Anchor																							
Bridge Supplemental Set - Anchorage - Developmental Testing									■																			
Structural Health Monitoring Project									■																			
Armored Combat Earthmover (ACE) Replacement									▲ MACE MDD								■											
(2) Mobile Armor Combat Earthmover Material Dev Decision																	■											
Mobile Armor Combat Earthmover Analysis of Alternatives																	■											
(3) Mobile Armor Combat Earthmover Capability Dev Document																					▲ MACE CDD							
Mobile Armor Combat Earthmover Request for Proposals Development																					■							
Family of High Military Load Capacity Bridging									▲ High MLC CDD				▲ High MLC MDD				■											
(4) High Military Load Capacity Bridging Abbreviated Capability Development																	■											
(5) High Military Load Capacity Bridging Material Dev Decision													■															
High Military Load Capacity Bridging Analysis of Alternatives													■															
(6) High Military Load Capacity Bridging Milestone "B"																	▲ High MLC MSB											

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) H02 / <i>Tactical Bridging - Engineering 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
(1) High Military Load Capacity Bridging Low Rate Initial Production																									 High MLC LRIP			

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Exhibit R-4A, RDT&E Schedule Details: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) H02 / <i>Tactical Bridging - Engineering Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Joint Assault Bridge Development and Testing	1	2016	1	2019
Joint Assault Bridge Live Fire Test & Eval Armor Development	1	2016	4	2016
Joint Assault Bridge Milestone "C"	3	2016	3	2016
Joint Assault Bridge Low Rate Initial Production	3	2016	3	2016
Joint Assault Bridge Critical Design Review	4	2016	4	2016
Joint Assault Bridge Life Fire Test & Eval	4	2016	4	2018
Joint Assault Bridge Production Qualification Test	4	2017	2	2018
Joint Assault Bridge Developmental Test / Operational Test	2	2018	2	2018
Joint Assault Bridge Initial Operational Test & Eval	3	2018	3	2018
Joint Assault Bridge Full Rate Production	1	2019	1	2019
Line Of Communication Bridge Development and Testing	2	2012	4	2018
Line Of Communication Bridge DT&E	1	2016	4	2016
Line Of Communication Bridge Durability	1	2016	4	2017
Line Of Communication Bridge Milestone "C"	3	2018	3	2018
Line Of Communication Bridge Log Demo	1	2019	1	2019
Line Of Communication Bridge IOT&E	2	2019	4	2019
Line Of Communication Bridge FRPDR	2	2020	2	2020
Bridge Supplemental Set	1	2016	4	2021
Bridge Supplemental Set Material Dev Decision	4	2016	4	2016
Bridge Supplemental Set MSC - Site Stability	4	2017	4	2017
Bridge Supplemental Set - Site Stability - Contract Award	4	2017	4	2017
Bridge Supplemental Set - Site Stability - Product Qualification Testing	1	2018	3	2018

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) H02 / <i>Tactical Bridging - Engineering Development</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
Bridge Supplemental Set MSB - Bridge Protection Device	2	2019	2	2019
Bridge Supplemental Set - Bridge Protection Device - Make or Buy Decision	2	2017	2	2017
Bridge Supplemental Set - Bridge Protection Device - Developmental Testing	1	2018	1	2019
Bridge Supplemental Set MSB - Anchorage	3	2018	3	2018
Bridge Supplemental Set - Anchorage - Make or Buy Decision	2	2017	2	2017
Bridge Supplemental Set - Anchorage - Developmental Testing	4	2017	4	2018
Structural Health Monitoring Project	1	2016	4	2016
Armored Combat Earthmover (ACE) Replacement	2	2018	4	2022
Mobile Armor Combat Earthmover Material Dev Decision	2	2018	2	2018
Mobile Armor Combat Earthmover Analysis of Alternatives	2	2020	3	2021
Mobile Armor Combat Earthmover Capability Dev Document	3	2021	3	2021
Mobile Armor Combat Earthmover Request for Proposals Development	4	2021	3	2024
Family of High Military Load Capacity Bridging	3	2017	2	2022
High Military Load Capacity Bridging Abbreviated Capability Dev Document	4	2017	4	2017
High Military Load Capacity Bridging Material Dev Decision	3	2018	3	2018
High Military Load Capacity Bridging Analysis of Alternatives	3	2018	4	2019
High Military Load Capacity Bridging Milestone "B"	1	2020	1	2020
High Military Load Capacity Bridging Low Rate Initial Production	2	2022	2	2022

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army										Date: May 2017		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev				Project (Number/Name) H14 / Materials Handling Equipment - Ed			
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
H14: Materials Handling Equipment - Ed	-	0.603	0.960	0.745	-	0.745	0.625	0.636	0.641	0.565	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports engineering, manufacturing, and development of Material Handling Equipment (MHE) including the 5K Light Capability Rough Terrain Forklifts (LCRTF), Rough Terrain Container Handler (RTCH) equipment, and other cargo handling related items to enable Combat Service Support units to rapidly and efficiently move and deliver critical supplies worldwide to the Soldier. Efforts performed under this project include conducting market research, supporting operational requirements identification and validation, conducting trade studies, generating life cycle cost estimates, performing system engineering, developing performance specifications, conducting pre-production test and evaluation, and preparing program management and acquisition documents.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Title: Platform Safety</p> <p>Description: Research and Demonstrate technologies which would enhance and improve the safe operation of Material Handling Equipment to include sensors and cameras.</p> <p>FY 2017 Plans: Investigate the possibility of transitioning the identified technology onto additional MHE platforms such as the All Terrain Lift Army System (ATLAS) and 5K Light Capability Rough Terrain Forklifts (LCRTF).</p> <p>FY 2018 Base Plans: Transition the identified technology onto additional MHE platforms such as the ALTAS and LCRTF.</p>	-	0.466	0.050	-	0.050
<p>Title: Material Handling Equipment System Improvement</p> <p>Description: Develop Work Tool Enhancement prototype systems to provide additional machine capability. This may include sweepers, buckets, lift devices, fork enhancements, etc. Investigate commercial solutions for MHE replacement and possible attachments to increase capabilities and versatility.</p> <p>FY 2017 Plans: Work with CASCOM to further define additional capability needs for the LCRTF and ATLAS system. Develop Work Tool Enhancement prototype systems to provide additional machine capability. This may include</p>	-	0.294	0.050	-	0.050

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) H14 / <i>Materials Handling Equipment - Ed</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
sweepers, buckets, lift devices, fork enhancements, etc. Investigate commercial solutions for MHE replacement and possible attachments to increase capabilities and versatility. FY 2018 Base Plans: Integrate commercial solutions for MHE replacements and possible attachments to increase capabilities and versatility.					
Title: System Engineering/Program Management Description: System Engineering and Program Management support for Material Handling Equipment. FY 2017 Plans: System Engineering and Program Management support for Material Handling Equipment FY 2018 Base Plans: Provide funds for System Engineering and Program Management support for Material Handling Equipment operations.	-	0.200	0.250	-	0.250
Title: Weight Reduction in Transparent Armor (TA) Description: Investigate technologies that will reduce the weight of TA while maintaining current protection levels or that will increase protection levels with no or minimal increase in weight. FY 2018 Base Plans: Continue the work under the TARDEC Transparent Armor (TA) Small Business Innovative Research (SBIR) program which has already shown positive results to quality TA at the current protection level and continue to develop higher level of protection.	-	-	0.195	-	0.195
Title: Rough Terrain Container Handler Component Modernization Description: Research, investigate, and develop solutions to mitigate obsolescence on Rough Terrain Container Handler (RTCH) vehicles. This effort includes reverse engineering the Electronic Control Unit (ECU) component to develop a replacement to obsolete ECUs. Develop Engineering Change Proposals (ECPs) to modernize fleet of RTCH vehicles which includes replacing wiring harness, cab, and ECUs. FY 2016 Accomplishments:	0.603	-	0.200	-	0.200

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) H14 / <i>Materials Handling Equipment - Ed</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Researched, investigated, and developed solutions to mitigate Rough Terrain Container Handler (RTCH) obsolescence. This effort includes reverse engineering the Electronic Control Unit (ECU) component to develop a replacement to obsolete ECUs. <i>FY 2018 Base Plans:</i> Develop Engineering Change Proposals (ECPs) to modernize fleet of RTCH vehicles which includes replacing wiring harness, cab, and ECUs.					
Accomplishments/Planned Programs Subtotals	0.603	0.960	0.745	-	0.745

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>
• G41002: <i>5K Light Capacity Rough Terrain (LCRT) Forklift</i>	27.982	3.153	9.000	-	9.000	17.937	18.297	19.721	20.345	Continuing	Continuing

Remarks

D. Acquisition Strategy
 Develop specifications for 5K Light Capability Rough Terrain Forklifts (LCRTF) improvements, and award contracts to produce test items for production verification testing. Testing LCRTF improvements to be performed using Army test facilities. Design lightweight armor solution for All Terrain Lift Army System (ATLAS) using U.S. Army TARDEC's Center for Ground Vehicle Development and Integration. Test armored ATLAS at Aberdeen Proving Ground, MD. Develop additional capabilities for existing systems such as the LCRFT, RTCH and ATLAS. Award contracts with vehicle or attachment technology Original Equipment Manufacturers to integrate existing commercial attachment technologies onto the platforms to improve operator functions and system usefulness. 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 / 5					R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev				Project (Number/Name) L39 / Field Sustainment Support Ed			
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
L39: Field Sustainment Support Ed	-	2.552	3.712	3.147	-	3.147	2.247	3.009	3.088	3.183	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the Engineering and Manufacturing Development (EMD) of critical capabilities for cargo aerial delivery for identified theater distribution and services capability gaps, improve unit sustainability, and increase combat effectiveness. Project supports the demonstration of engineering development models and Type Classification of cargo parachutes, airdrop containers and other aerial delivery equipment to improve safety, effectiveness, and efficiency of airborne operations. This project develops critical enablers that support the Quartermaster (QM) Force Transformation Strategy and the Army's Modular Force Capabilities by maintaining readiness through fielding and integrating new equipment. This project also ensures Army Expeditionary Forces are capable of rapid deployment by providing aerial delivery initiatives. These reduce sustainment requirements, related Combat Support/Combat Service Support (CS/CSS), lift demands, the 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: Advanced Low Velocity Airdrop System (ALVADS) - Light and Heavy	2.552	2.444	0.119	-	0.119
Description: ALVADS - Light and Heavy are capable of airdrop operations at an altitude down to 750-ft Above Ground Level (AGL) for ALVADS-L and 975-ft AGL for ALVADS-H, while retaining the objective altitude of 500-ft AGL for both with increased aircraft survivability, and improved accuracy. Light-Gross rigged weight of 2,520-22,000 lbs and Heavy-Gross rigged weight of 22,001-42,000 lbs.					
FY 2016 Accomplishments: Conducted and completed Production Qualification Testing (PQT) and initiate Operational Testing (OT).					
FY 2017 Plans: Complete OT, prepare Milestone C documentation, and complete logistics deliverables. Obtain Milestone C decision and transition ALVADS into production.					
FY 2018 Base Plans: Complete logistics deliverables. Obtain Milestone C decision and transition ALVADS into production.					
Title: Extracted High and Low High Speed Container Delivery System (EHLSCDS)	-	1.268	1.228	-	1.228

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L39 / <i>Field Sustainment Support Ed</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Description: Provides a high speed (230 knot) low altitude (375 A AGL) capability for up to eight Container Delivery Systems (CDS) to enhance aircraft and aircrew safety while improving accuracy and reducing dispersion for receiving ground units.</p> <p>FY 2017 Plans: Conduct Operational Testing (OT). Prepare Milestone C documentation and complete logistics deliverables.</p> <p>FY 2018 Base Plans: Conduct and complete Operational Testing (OT). Begin preparation for Milestone C documentation and complete logistics deliverables.</p>					
<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 2018 Base Plans: Begin system level qualification flight testing of JPADS 2K Block 1 integrated improvements in support of an updated Army Test and Evaluation Command (ATEC) safety confirmation for the JPADS 2K enhancements.</p>	-	-	1.800	-	1.800
Accomplishments/Planned Programs Subtotals	2.552	3.712	3.147	-	3.147

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
• 643804 K39: <i>Field Sustainment Support AD, 643804 K39</i>	1.800	2.629	2.429	-	2.429	2.507	1.868	1.917	1.975	Continuing	Continuing
• MA7806: <i>Precision Airdrop</i>	3.291	4.298	2.167	1.980	4.147	2.178	2.219	2.282	2.348	Continuing	Continuing

Remarks

D. Acquisition Strategy
Accelerate product development and testing to transition into production.

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L39 / <i>Field Sustainment Support Ed</i>

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 / 5					R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>				Project (Number/Name) L41 / <i>Water And Petroleum Distribution - Ed</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
L41: <i>Water And Petroleum Distribution - Ed</i>	-	3.228	8.363	8.005	-	8.005	14.468	9.510	9.581	9.697	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project provides all services with ample supply of clean fuel and water. The Army has the mission to supply fuel for all land-based forces, including the Marines and the Air Force, and must supply bulk drinking water to the Soldiers. These Engineering and Manufacturing Development programs enable the Army to improve maneuver sustainment operations to meet the demands of the Stryker Brigade Combat Teams and the Future Force. The mission includes receiving and transferring petroleum from trucks, ships, pipelines and permanent and temporary storage facilities; moving petroleum from storage to and within corps and division areas; fuel quality surveillance testing; and dispensing in support of tactical operations, including rapid refueling of aircraft. The mission covers water purification and waste water treatment, reutilization, storage, distribution, alternative water source acquisition, disposal, and quality control of water. The Army cannot fight without clean fuel and water. These Research and Development (R&D) missions support the development and enhancement of rapidly deployed Petroleum and Water equipment which enables the Army to achieve its vision by providing a highly mobile and self-sustaining system in hostile joint operations areas.

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 (TWPS).	0.328	3.100	2.827	-	2.827
Description: Funding is provided for the following effort.					
FY 2016 Accomplishments: Completed detailed system design and prepared Milestone B program documentation and analysis. Prepared for Preliminary Design Review (PDR) in 2Q FY17. Conducted detailed technical review of piping and instrumentation design in preparation for PDR. Fabricated International Organization for Standardization (ISO) structure and prepared for test. Conducted freshwater and saltwater testing of breadboard system to validate component design.					
FY 2017 Plans: Develop in-house technical manual for Production Qualification Testing (PQT). Detailed design work for prototype. System design and development leading to Critical Design Review (CDR) in 2QFY18.					
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 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L41 / <i>Water And Petroleum Distribution - Ed</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Conduct Critical Design Review (CDR) 2Q FY18. Build prototype and begin technical data package (TDP) development. Test Readiness Review 4Q FY18					
Title: Fuel System Supply Point (FSSP) Common Pump Description: Funding is provided for the following effort FY 2017 Plans: Finalize the Technical Data Package (TDP) for the common pump which operates at either 350 or 600 Gallons per Minute so that it is ready to use for procurement.	-	0.100	-	-	-
Title: Small Unit Water Purifier Description: Funding is provided for the following effort. FY 2017 Plans: Requirements refinement and technology development.	-	0.169	-	-	-
Title: Modular Tactical Retail Refueling System (MTRRS) Description: Funding is provided for the following effort. FY 2016 Accomplishments: Continued prototype testing from FY15. Refined technical manuals and technical data package (TDP) drawing package. Began to transition technical data to program manager for competitive procurement. FY 2017 Plans: Develop Acquisition Strategy. Develop and prepare Milestone B/C documentations. Develop Request For Proposal (RFP) for FY18 release.	0.800	0.500	-	-	-
Title: Water Bison Description: Funding is provided for the following effort. FY 2017 Plans: Develop Request for Proposal (RFP). Develop and prepare Milestone B documentation. Develop contract language in preparation for FY18 award. FY 2018 Base Plans:	-	0.800	0.133	-	0.133

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L41 / <i>Water And Petroleum Distribution - Ed</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Release Request for Proposal (RFP). Continue working Milestone B/C documentation. Develop Scope of Work.					
<p>Title: Early Entry Fluid Distribution System (E2FDS).</p> <p>Description: Funding is provided for the following effort</p> <p>FY 2016 Accomplishments: Completed initial design of E2FDS. Initiate the Critical Design Review (CDR) of the E2FDS prototype. Initiated fabrication of prototype for testing under EMD phase.</p> <p>FY 2017 Plans: Complete Product Verification Testing (PVT) for system. Collect and begin analyzing test data to inform an FY18 Fair Opportunity Decision. Conduct early supportability analyses, and evaluate draft Operator Manuals.</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.</p>	2.100	2.001	2.985	-	2.985
<p>Title: Petroleum Expeditionary Analysis Kit (PEAK)</p> <p>Description: Funding is provided for the following effort.</p> <p>FY 2017 Plans: Establish new Integrated Product Team (IPT) for the development of initial draft documentation and preparation for entry into Milestone B. Initiate new market investigations for potential commercial solutions that can address the identified requirements gap. Prepare the preliminary draft of the performance specification for EMD phase.</p> <p>FY 2018 Base Plans: Prepare and release developmental Request For Proposal (RFP). Prepare documents and achieve Milestone B. Award Developmental Contract.</p>	-	0.500	1.893	-	1.893
<p>Title: Army Fuel Automated Management System (AFAMS) Tank Gauging</p> <p>Description: Funding is provided for the following effort.</p> <p>FY 2017 Plans:</p>	-	0.426	-	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L41 / <i>Water And Petroleum Distribution - Ed</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Continue development and integration of sensors into fuel storage systems to report fuel levels to the AFAMS system.					
<p>Title: Modular Fuel System (MFS)</p> <p>Description: Funding is provided for the following effort.</p> <p>FY 2017 Plans: Complete Initial Operational Test and Evaluation (IOT&E) to include the Pump Rack Module (PRM) and 2 different models of the Tank Rack Module (TRM).</p>	-	0.100	-	-	-
<p>Title: Bulk Petroleum Trailers</p> <p>Description: Funding is provided for the following effort.</p> <p>FY 2017 Plans: Conduct market research and provide engineering support for the Cost-Benefit Analysis (CBA) and Capabilities Development Document (CDD) generation.</p> <p>FY 2018 Base Plans: Finalize the Purchase Description (PD) and Request for Proposal (RFP) for Bulk Petroleum Tankers and conduct the source selection process.</p>	-	0.167	0.167	-	0.167
<p>Title: Pipeline Trace Tool</p> <p>Description: Funding is provided for the following effort.</p> <p>FY 2017 Plans: Mature pipeline trace tool software developed under a Small Business Innovative Research (SBIR) contract so that it meets end user requirements and can be used on army networks. Conduct user juries and incorporate feedback. Validate and verify the software and obtain a certificate of network worthiness.</p>	-	0.500	-	-	-
Accomplishments/Planned Programs Subtotals	3.228	8.363	8.005	-	8.005

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L41 / <i>Water And Petroleum Distribution - Ed</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
• 0603804/K41: <i>RDTE, Logistics and Engineer Equipment - Advanced Development</i>	3.615	3.662	4.773	-	4.773	-	-	-	-	Continuing	Continuing
• MA6000 (MA6000): <i>OPA 3, Distribution Systems, Petroleum & Water</i>	35.381	120.896	47.597	-	47.597	49.027	52.589	46.825	36.885	Continuing	Continuing
• Parent MB6400: R67500 (Baby): <i>Petroleum Quality Analysis System (R67500)</i>	5.368	9.287	6.903	-	6.903	6.670	-	-	-	0	28.228

Remarks

D. Acquisition Strategy

Develop engineering prototypes for the 3K Tactical Water Purification System (3K TWPS), Bulk Petroleum Tankers, Early Entry Fluid Distribution System (E2FDS) and select Non-Development Item (NDI) based on market surveys and proposals from industry. Based on market research, will award either competitive or sole source contracts. Initiate IPT's and develop acquisition strategies for Water Bison, Petroleum Expeditionary Analysis Kit (PEAK) and Small Unit Water Purifier (SUWP).

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 / 5					R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev				Project (Number/Name) L43 / ENGINEER SUPPORT EQUIPMENT - ED			
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
L43: ENGINEER SUPPORT EQUIPMENT - ED	-	0.836	2.445	3.795	-	3.795	1.750	1.056	3.381	0.200	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

This project supports development, demonstration, testing and evaluation within the Combat Engineer and Construction Support Equipment arena. These items include critical life support equipment such as diving, fire fighting, fire suppression, urban operations, breathable air compressors, and emergency and recovery sets along with engineer safety and special unit support equipment and photo support sets. The Combat Engineer and Construction equipment consists of the Surveying, Firefighting Individual Requirements Equipment Support (FIRES), Urban Search and Rescue (USR), Fire Protection Equipment Type I, II and III, Tactical Fire Fighting Truck Tools (TFFT), Family of Electrical Personal Protective Equipment (FoEPPE) Family of Power Utility Kits (FoPUK), Distribution Utility Construction Kits (DUCT) and Soldier Portable Kits, Lineman's Tool Kit, Concrete and Masonry, Electricians, Plumbers, Pipefitters, Family of Light Sets (FoLS), Airfield Damage Repair Kit (ADRK), Diving Equipment, Surface Swimmer Support Sets, Surface Supplied Diving Set, procurement of new Technical/Special Tools, Pioneer Support Set, and the Pioneer Land Clearing and Building Erection Set. Project will explore Additive Manufacturing for Engineer systems. Funding will support the procurement of market samples and testing for Soldier Portable Sets, Kits, and Outfits (SKO), and critical life support equipment such as the Deep Sea Set, Underwater Construction Set, Closed Circuit Scuba Set, Supervisor Propulsion Emergency and Recovery SCUBA (SPEaRS), Divers' Supplemental Issue Set(DSIS), Vertical Skills Engineer Construction Kit (VSECK), and Family of Boats and Motors (FOBAM). All of these programs are in the Engineering and Manufacturing Development Phase.

BUDGET ITEM JUSTIFICATION: These systems provide state-of-the-art deployable, critical life support and combat engineer and construction equipment along with engineer safety and special unit support equipment supporting the joint warfighter. These programs will minimize transportation requirements and reduce the logistical footprint by eliminating obsolete equipment and reducing the number of programs. Funding shall allow for development of dual use systems that support wartime use by soldiers to include Special Forces and peacetime operations that include national disaster relief and homeland security operations. Much of this equipment has an inherent short Economic Useful Life (EUL). Investments used to revise, update and obtain equipment within this portfolio has resulted in reductions in footprint, and increases in safety, effectiveness, and readiness.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Family of Power Utility Kits (FoPUK)	-	0.750	2.026	-	2.026
Description: Conduct Market Research, Develop, and Initiate procurement activities for Family of Power Utility Kits (FoPUK).					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L43 / <i>ENGINEER SUPPORT EQUIPMENT - ED</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>FY 2017 Plans: Conduct Market Research, Develop, and Initiate procurement activities for conceptual Engineer Safety and Special Unit Systems to include but not limited to Family of Power Utility Kits (FoPUK).</p> <p>FY 2018 Base Plans: Procure and test Production Representative System, Engineering and Quality Assurance support for documentation.</p>					
<p>Title: Urban Search and Resue (USR)</p> <p>Description: Conduct Market Research, prepare documentation, and procure market samples for the Urban Search and Rescue (USR).</p> <p>FY 2017 Plans: Conduct Market Research, Develop and Procure conceptual Engineer Combat and Construction Sets to include but not limited to Urban Search and Rescue (USR).</p> <p>FY 2018 Base Plans: Technical Manual publication and verification. Production Representative System testing and adjustments. Provide Engineer, Quality Assurance, and program management support.</p>	-	1.345	0.980	-	0.980
<p>Title: Supervisory Propulsion, Emergency and Recovery Set (SPEaRS)</p> <p>Description: Prepare documentation, conduct market research, procure production representative, and complete required testing.</p> <p>FY 2017 Plans: Documentation preparation and market research.</p> <p>FY 2018 Base Plans: Documentation preparation, production representative system, testing support. Provide Engineer, Quality Assurance, and program management support.</p>	-	0.350	0.479	-	0.479
<p>Title: Engineering and Quality Assurance</p> <p>Description: Engineering and Quality Assurance of engineering SKOs</p> <p>FY 2016 Accomplishments:</p>	0.245	-	0.160	-	0.160

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L43 / <i>ENGINEER SUPPORT EQUIPMENT - ED</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Engineering Spt- 75K for Boats, Motors, Diving; 200K for Soldier Portable QA Support- 25K for Boats, Motors, Diving; 100K for Soldier Portable FY 2018 Base Plans: Engineering and Quality Assurance of engineering SKOs					
Title: Family of Boats and Motors (FOBAM) Description: Development of various Assault Boats and Outboard Motors FY 2016 Accomplishments: Supported logistics plans and Full Rate Production Decision (Milestone C, Type Classification, Full Material Release)	0.341	-	-	-	-
Title: Vertical Skills Engineer Construction Kit (VSECK) Description: Research, Development, and Testing of Vertical Skills Engineer Construction Kit (VSECK) FY 2016 Accomplishments: Procured market samples for Type 1 through Type 6 kits	0.250	-	-	-	-
Title: Airfield Damage Repair Kit (ADRK) Description: Conduct Market Research and Procure Market Samples for the ADRK. FY 2018 Base Plans: Documentation preparation, product representative set, Engineer Quality Assurance, and Program management.	-	-	0.150	-	0.150
Accomplishments/Planned Programs Subtotals	0.836	2.445	3.795	-	3.795

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
• OPA 3 R70001: OPA 3 <i>R70001, Family of Engineering Combat and Construction Sets</i>	34.544	39.173	10.426	-	10.426	6.719	16.529	22.996	31.490	Continuing	Continuing
• OPA 3 R12001: OPA 3 R12001, <i>Family of Boats and Motors</i>	8.429	3.451	4.302	-	4.302	5.966	4.199	2.663	1.951	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L43 / <i>ENGINEER SUPPORT EQUIPMENT - ED</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

Programs will progress from requirements generation through market research, market samples, Description for Purchase, development, production representative systems and testing. Modernization and Optimization of existing tools and testing of market samples will progress from Engineering and Manufacturing Development (EMD) and transition into production. All efforts will support the two level maintenance concept utilizing commercial technologies and incorporating them into SKOs to support next generation weapon and support systems.

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 / 5					R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>				Project (Number/Name) L46 / <i>Maintenance Support 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
L46: <i>Maintenance Support Equipment</i>	-	1.021	1.886	2.053	-	2.053	1.885	1.919	1.970	1.851	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

Mobile Maintenance Equipment provides state of the art, deployable, vehicle-mounted, soldier portable and containerized shelter tool systems supporting the Joint warfighter. These systems are equipped with industrial quality tools required for Two Level Maintenance that reduce common tool redundancy, provide tool standardization, minimize transportation requirements, reduces logistical footprint, and are backed by a Lifetime Warranty/Replacement Program which reduces sustainment costs. This is accomplished by employing a system of systems approach to maintenance acquisition. The system of systems approach builds a maintenance capability upon each system, allowing a logical and natural approach to the Army's overall two level maintenance strategy. These inter-connected systems distributed throughout the Army at multiple levels and echelons provide a holistic repair capability in all scenarios and environments. These systems provide the Maintenance and Combat Commanders an unprecedented capability to repair wheeled, tracked, aviation, ground support and weapons systems on site at one location at one time. This approach to maintenance acquisition increases efficiencies and supports the current force while providing modular configurations designed to meet the specific needs of the Army maintainer in today's complex transforming environment. All of these programs are in the Engineering and Manufacturing Development Phase.

BUDGET ITEM JUSTIFICATION: The need to develop and maintain a System of System maintenance approach is critical due to the growing complexity of today's military equipment, operational tempo, modularity, and current and evolving Tactics Techniques and Procedures (TTPs). The individual maintenance systems are comprehensive, interconnected and capable of solving and repairing any maintenance problems. The System of Systems approach does not advocate specific tools, methods or practices; instead it seeks to promote a streamlined comprehensive set of systems for solving maintenance challenges where the interactions of doctrine, technology, time and tactics techniques and procedures are the primary drivers. Funding for projects shall include test article procurement and testing of soldier portable maintenance SKOs, load banks and refrigeration tool kit; investigation of new technologies for next generation mobile maintenance equipment shop sets including the Shop Equipment Welding (SEW) and Shop Equipment Contact Maintenance (SECM); development of additional Standard Automotive Tool Set (SATS) maintenance modules, Armament Repair Shop Set 2, Mobile Ammunition Processing Facility (MAPF), Special Tools initiatives, Shelter Mounted system Development; packaging development; and technical support for emerging JCIDS materiel requirements documents. Upgrades to existing shelter mounted systems to include a 3-D printing/additive manufacturing/digital library capability as well as use of lower cost set components. Modernization upgrades to increase effectiveness while improving efficiency, reliability and maintainability while supporting emerging Army systems to include the Joint Light Tactical Vehicle (JLTV) and Armored Multi-Purpose Vehicle (AMPV).

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L46 / <i>Maintenance Support Equipment</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Title: Next Generation Shop Equipment, Welding (SEW)</p> <p>Description: Develop and Test new components of Shop Equipment, Welding</p> <p>FY 2016 Accomplishments: Engineer and Quality Assurance Support updated the Technical Data Package (TDP) for the Production Representative System (PRS) build effort.</p> <p>FY 2017 Plans: PRS Build, TDP Update, Testing</p> <p>FY 2018 Base Plans: Test, Technical Manual Validation, Logistics Demonstration, Technical Manual Verification</p>	0.700	0.965	0.618	-	0.618
<p>Title: Armament Repair Shop Set (ARSS) 2</p> <p>Description: ARSS Shelter Modernization</p> <p>FY 2018 Base Plans: Build the PRS with depot and test the PRS. Provide Engineer, Quality Assurance, and program management support.</p>	-	-	0.550	-	0.550
<p>Title: Special Tools</p> <p>Description: Develop Rapid Deployment Sets, Kits, and Outfits (SKOs) - Special Tool and support to Tactical and Combat Vehicles.</p> <p>FY 2017 Plans: Market Research for Special Tools</p> <p>FY 2018 Base Plans: Market Research for Special Tools</p>	-	0.043	0.016	-	0.016
<p>Title: Refrigeration Tool Kit (RTK)</p> <p>Description: Develop tool load, packaging, description for proposal. Conduct market research. Procure test articles and test RTK.</p> <p>FY 2016 Accomplishments:</p>	0.131	0.263	0.336	-	0.336

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army			Date: May 2017		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L46 / <i>Maintenance Support Equipment</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Conducted market research for RTK. FY 2017 Plans: Conduct market research for RTK and buy test articles FY 2018 Base Plans: Logistics Demonstration, Validation and Verification					
Title: Additive Manufacturing Description: Conduct research and testing to systems to include 3-D printing/Additive Manufacturing/Digital Library. FY 2018 Base Plans: Develop additive manufacturing capability for Army systems, Limited User Testing and Evaluation. Conduct market research.	-	-	0.028	-	0.028
Title: Packaging Support Description: Full Packaging Program Support and Packaging Data Management FY 2017 Plans: Develop and Maintain Logistics Packaging, Packing and Palletization data FY 2018 Base Plans: Develop and Maintain Logistics Packaging, Packing and Palletization data	-	0.037	0.089	-	0.089
Title: Engineering and Quality Assurance Support Description: Engineering Support from the Edgewood Chemical Biological Center (ECBC). FY 2017 Plans: Support to Research, Development, Test and Evaluation (RDT&E) funded Mobile Maintenance Equipment Systems (MMES) efforts. FY 2018 Base Plans: Support to RDTE funded Ordnance Portfolio SKOs	-	0.123	0.148	-	0.148
Title: Mobile Maintenance Equipment Shop Set	0.070	0.455	-	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L46 / <i>Maintenance Support Equipment</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>Description: Modernization / Redesign efforts of maintenance support equipment of the Mobile Maintenance Equipment Systems in support of technological advances, environmental/safety constraints and to support emerging systems</p> <p>FY 2016 Accomplishments: Provided market research for Metal Working and Machine Shop Set (MWMSS) Type III, market research on Next Generation Generator, Crane and other components for Forward Repair System (FRS) & SECM.</p> <p>FY 2017 Plans: Market Research for MWMSS Type III, market research on Next Generation Generator, Crane and other components for FRS & SECM.</p>					
<p>Title: Load Banks</p> <p>Description: PRS Procurement, Test support, Engineering Support and QA Support for Load Banks.</p> <p>FY 2016 Accomplishments: Successful Test, Engineering Support and QA Support for Load Banks.</p>	0.120	-	-	-	-
<p>Title: Mobile Ammunition Processing Facility (MAPF)</p> <p>Description: Development and Test of MAPF.</p> <p>FY 2018 Base Plans: Concept design, prototype development, and program support</p>	-	-	0.268	-	0.268
Accomplishments/Planned Programs Subtotals	1.021	1.886	2.053	-	2.053

C. Other Program Funding Summary (\$ in Millions)		FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Line Item	FY 2016	FY 2017								
• OPA 3 ML5345: OPA 3 <i>ML5345, Items Less Than \$5.0M (MAINTENANCE EQUIPMENT)</i>	2.760	2.861	2.728	-	2.728	2.743	4.730	4.576	4.642	Continuing Continuing
• OPA 3 G05301: OPA 3 <i>G05301, Mobile Maintenance Equipment Systems</i>	25.270	37.303	33.774	1.124	34.898	39.920	57.841	53.429	56.672	Continuing Continuing

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L46 / <i>Maintenance Support Equipment</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

Programs will progress from requirements generation through market research, market samples, Description for Purchase, development, production representative systems and testing. Modernization and Optimization of existing tools and testing of market samples will progress from Engineering and Manufacturing Development (EMD) and transition into production. All efforts will support the two level maintenance concept utilizing commercial technologies and incorporating them into SKOs to support next generation weapon and support systems.

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 / 5					R-1 Program Element (Number/Name) PE 0604804A / Logistics and Engineer Equipment - Eng Dev				Project (Number/Name) L47 / Improved Environmental Control Units Ed			
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
L47: Improved Environmental Control Units Ed	-	0.726	1.259	1.951	-	1.951	3.827	2.177	2.232	2.295	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Not applicable for this item.

A. Mission Description and Budget Item Justification

The Improved Environmental Control Units (IECU) program will provide updates that support the new generation of Environmental Control Units (ECUs) that use environmentally approved refrigerants, with zero Ozone-Depleting Chemicals (ODCs) to replace the current Military Standard (MIL-STD) Family of ECUs. The IECUs will provide improved cooling, heating and dehumidification to soldiers and materials systems in combat, combat support and combat service support units. The IECUs are required to replace currently fielded ECUs in order to comply with statutory and regulatory restrictions on the use of Class II ODCs (such as HCFC-22) and to improve the performance of military ECUs. They are form, fit, and function replacements to the current MIL-STD ECUs. Technical improvements over existing ECUs will yield significant fuel and weight savings, reduction in scheduled maintenance and increased reliability. The new family of IECUs will utilize a new refrigerant which complies with mandated Environmental Protection Agency (EPA) requirements. Funding supports the development of trailer-mounted systems, shelter system integrations, as well as supporting the new ECU requirements coming from the Army Standard Family of Soft Walled Shelters (ASF-SWS) and Army Standard Family of Rigid Wall Shelters (ASF-RWS) Capabilities Development Documents (CDDs). In addition, the field has identified an emerging requirement for an integrated fuel-fired /cooling system. These variants will further standardize cooling units in the field, enable cooling of larger shelters and structures, offer increased mobility, and may be used to cool multiple tents with one unit. Funding also supports continued evaluation of IECUs and variants at Network Integration Evaluation (NIE) to support new operational concepts and supports development of new ECU and refrigeration products to ensure compliance with changing and more restrictive environmental regulations.

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

	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Title: Technology Development	0.100	0.400	0.375	-	0.375
Description: Concept development for 9/18/36/60K BTUH Improved Environmental Control Unit (IECU), multiple trailer-mounted variants, Rigid Walled variants and integrated heating/cooling systems.					
FY 2016 Accomplishments: Completed assembly of a Command Post Operational Energy System (CPOES) prototype which is a scalable trailer mounted Command Post solution for brigade to company level consisting of power generation / distribution, two integrated IECUs and an air supported shelters. Conducted evaluation and demonstration of the CPOSE at the NIE. Conducted evaluation of energy efficient solutions for Force Provider Expeditionary 150-man soldier module and other shelter systems. Completed evaluation on FPE 150-soldier module with					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L47 / <i>Improved Environmental Control Units Ed</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>modifications to the existing ECUs that reduce energy demand. These efforts complement improved shelter and subsystem efficiencies, significantly reducing the fuel and resource demand on base camps operations.</p> <p>FY 2017 Plans: Support continuing technology insertions and demonstration of prototypes for follow-on IECU variants.</p> <p>FY 2018 Base Plans: Study technologies with variable capacity compressors, applicability of smart electronic controls that vary the capacity and efficiency, which allow for operation at the maximum temperature while being most efficient at lower temperatures. Current ECUs may have variable speed fans and/or compressors but may not have the electronic controls necessary that would allow a true reduction in capacity and corresponding increase in efficiency.</p>					
<p>Title: Government System Test and Evaluation</p> <p>Description: Testing of prototype performance for the trailer mounted and other variants of the IECUs and soft wall shelter ECUs.</p> <p>FY 2016 Accomplishments: Completed performance testing on the CPOES prototype. Conducted evaluation and demonstration of the CPOES at the NIE. Completed evaluation of FPE 150-soldier module with modifications to the existing environmental control units that reduce energy demand at the Ft Devens Base Camp Integration Laboratory (BCIL).</p> <p>FY 2017 Plans: Conduct performance tests on follow-on IECU systems.</p> <p>FY 2018 Base Plans: Support performance testing prototypes for follow-on variants that meet identified requirements for multiple trailer-mounted variants, soft wall ECUs, and integrated heating/cooling units. Support Engineering and Manufacturing Development (EMD) effort on the 9/18/36K IECU family and comply with tightening statutory and regulatory restrictions. Conduct testing on possible product improvements to the existing family of IECUs.</p>	0.050	0.200	0.300	-	0.300
<p>Title: Other Contract and Government Agency</p> <p>Description: Support engineering, logistics, and testing efforts for multiple trailer-mounted variants, soft wall ECUs, and integrated heating/cooling units. Support EMD effort, match and right-size current IECU family to the</p>	0.526	0.400	0.898	-	0.898

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L47 / <i>Improved Environmental Control Units Ed</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>ASF-RWS and ASF-SWS variants and/or develop and test new variants to provide the most efficient system solution.</p> <p>FY 2016 Accomplishments: Completed assembly of a CPOES prototype. Conducted evaluation and demonstration of the CPOES at the NIE. Completed evaluations on FPE 150-solder module with modification to the existing ECUs that reduce energy demand. These efforts compliment improved shelter and subsystem efficiencies significantly reducing the fuel and resource demand on base camp operations.</p> <p>FY 2017 Plans: Support engineering, logistics, and testing efforts for follow-on IECU variants.</p> <p>FY 2018 Base Plans: Support continuing technology transitions and insertions through prototype demonstrations for follow-on IECU variants that meet the requirements to support the Command Post Integrated Infrastructure (CPI2), Army Standard Family of Rigid Wall Shelter (ASF-RWS) and Army Standard Family of Soft Wall Shelters (ASF-SWS) programs.</p>					
<p>Title: Government Program Management</p> <p>Description: Provide oversight and management of engineering, logistics, contracts, and testing efforts for the 9/18/36/60K IECU family and multiple trailer-mounted variants prepare for IECU variants to transition to production. Provide oversight and management of follow-on ECU variants.</p> <p>FY 2016 Accomplishments: Provided critical oversight and management of engineering, logistics, contracts, and testing efforts supporting the assembly, evaluation, and demonstration of the CPOES prototype. Provided key technical input to the development of the ASF-RWS and ASF-SWS Capability Development Documents (CDDs) with focus on considering shelters and associated environmental control as an integrated system and the use of existing or modified variants of the IECU standard family to the greatest extent possible.</p> <p>FY 2017 Plans: Oversight and management of engineering, logistics, contracts, and testing efforts for follow-on IECU variants.</p> <p>FY 2018 Base Plans:</p>	0.050	0.259	0.378	-	0.378

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) L47 / <i>Improved Environmental Control Units Ed</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Manage continuing technology insertions and demonstrations of prototypes for follow-on variants that meet requirements of the ASF-RWS and comply with tightening statutory and regulatory restrictions.					
Accomplishments/Planned Programs Subtotals	0.726	1.259	1.951	-	1.951

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>
• MF9303: OPA 3, <i>Improved Environmental Control Units , MF9303</i>	1.360	19.601	7.405	0.270	7.675	13.521	12.012	27.857	28.090	Continuing	Continuing

Remarks

D. Acquisition Strategy

Begin development for efforts in support of multiple trailer-mounted IECU variants. The initial prototypes of the trailer-mounted variants will be assembled in house, with eventual production via depot-level integration of Government Furnished Equipment (GFE) from existing production contracts. Support technology insertions required to adapt IECUs to support future Integrated Command Post heating and cooling requirements in support of Force 2025 and the Command Post Initial Capabilities Document (ICD). Evaluate requirements versus existing IECU Fleet and developed/test initial prototypes of ECUs in support of ASF-SWS and ASF-RWS CDDs. This effort will support the development of Purchase Descriptions (PDs) and Technical Data Packages (TDPs) for eventual competitive procurement.

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 / 5					R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>				Project (Number/Name) VR7 / <i>Combat Service Support 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
VR7: <i>Combat Service Support Systems</i>	-	5.346	4.325	3.743	-	3.743	5.424	6.377	5.053	5.515	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project supports the Engineering and Manufacturing Development (EMD) of critical distribution and sustainment capabilities to include base camp subsystems, field shelters, showers, latrines, heaters, mortuary affairs systems, camouflage systems, organizational equipment, and other combat service support equipment to fill identified theater distribution and services capability gaps, improve unit sustainability, improve resource and energy efficiency and increase combat effectiveness. Project supports development of expeditionary tactical field systems and support equipment to improve safety, effectiveness, and efficiency of deployed soldiers. This project develops critical enablers that support the Quartermaster (QM) Force Transformation Strategy and the Army's Modular Force 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), lift demands, the 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: Expeditionary Shelter Protection System (ESPS)	0.744	0.400	0.450	-	0.450
Description: ESPS is a lightweight, rapidly deployable and reusable ballistic protection system that can be integrated with commonly used military shelters in expeditionary and remote base camps and outposts where more robust forms of ballistic protection (i.e. sandbags, concrete barriers) are not readily available or logistically feasible.					
FY 2016 Accomplishments: Prepared specification and prepared/released solicitation for ESPS development contract.					
FY 2017 Plans: Conduct DT/OT, continue logistics requirements and initiate preparation of documentation for ESPS to support production decision and full production in FY18.					
FY 2018 Base Plans: Build test items and conduct Developmental testing/Operational testing (DT/OT) for ESPS. Develop logistics requirements and programmatic documentation to support transition into production for ESPS. Prepare and coordinate Engineering Change Proposals (ECPs) to incorporate ESPS into Force Provider in FY19.					
Title: Family of Space Heaters	0.150	0.150	0.250	-	0.250

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) VR7 / <i>Combat Service Support Systems</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
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Description: The family of Army Space Heaters support soldiers operating in basic, cold and extreme cold environments with a safe, portable, lightweight, multi-fueled, self-powered, space heaters for use in tents and/ or expeditionary shelters that do not require an external power source. These heaters provide the much needed capability of providing heated air effectively and efficiently while eliminating the shortcomings of the antiquated, dangerous and inefficient heaters they are replacing in the inventory.

FY 2016 Accomplishments:
Conducted Production Qualification Testing (PQT), User Evaluation and initiated development of logistics requirements and programmatic documentation to support transition into production for Improved Army Space Heater (IASH) Type II in FY17.

FY 2017 Plans:
Complete logistics requirements, obtain Type Classification decision approval for IASH Type II and begin full production.

FY 2018 Base Plans:
Conduct evaluations for potential product improvements to the existing Family of Space Heaters. Prepare and coordinate Engineering Change Proposals that incorporate improvements into heater performance specifications.

Title: Net-Zero Energy Efficiency Solutions	1.388	1.320	0.655	-	0.655
Description: Net-Zero Energy Efficiency Solutions reduce the operational energy and logistics footprint of the expeditionary base camp system, with the goal being a significant reduction in fuel, water, material and power requirements to sustain operations in the field. Effort includes reducing site preparation, sustainment, 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 on Net-Zero energy efficiency solutions for Force Provider. Completed Development Testing/Operational Testing (DT/OT) on Force Provider Resource and Energy Efficient Rigid-Wall Shelter based 150-Soldier module with integrated state-of-the-art shelter energy efficiency upgrades. Completed evaluation					

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>on Force Provider 150-Soldier module with modifications to the existing environmental control units that reduce energy demand. Transitioned proven and validated capabilities into full-rate production and reset.</p> <p>FY 2017 Plans: Conduct evaluation on Net-Zero energy efficiency solutions for Force Provider. Complete DT/OT on Force Provider solar water heating subsystem, smart base monitoring and mature expeditionary shelter energy efficiency upgrades. Transition solar water heating subsystem and smart base monitoring into production. Transition proven and validated capabilities into full-rate production.</p> <p>FY 2018 Base Plans: Conduct evaluation on Net-Zero energy efficiency solutions for Force Provider. Complete DT on alternative energy subsystems that can integrate into the Force Provider module, energy-efficient appliances, smart base monitoring and mature expeditionary shelter energy efficiency upgrades. Transition proven and validated capabilities into full-rate production and/or reset.</p>					
<p>Title: Laundry and Shower Improvements</p> <p>Description: Provides an enhanced capability for field hygiene with improved hot and cold weather performance, better compatibility with current and future combat clothing, and increased reliability, maintainability and ease of operation.</p> <p>FY 2016 Accomplishments: Continued development of hardware improvements. Conducted Developmental Testing (DT) on prototype subsystems and components for the Containerized Batch Laundry (CBL). Analyzed options to replace obsolete commercial washers and dryers.</p> <p>FY 2017 Plans: Complete testing of prototype system improvements. Update Technical Data Packages and product support documentation and transition to production.</p> <p>FY 2018 Base Plans: Conduct Developmental Testing on improvements developed for the Laundry Advanced System (LADS).</p>	0.225	0.600	0.800	-	0.800
<p>Title: Expeditionary Solid Waste Disposal (ESWDS) 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 pounds (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,</p>	0.339	0.845	0.350	-	0.350

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) VR7 / <i>Combat Service Support Systems</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
<p>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: Contracted for Expeditionary Solid Waste Disposal System (ESWDS) prototype integration and preliminary system level testing and reporting.</p> <p>FY 2017 Plans: Complete DT and conduct Operational Test (OT) on ESWDS.</p> <p>FY 2018 Base Plans: Complete DT and conduct Operational Test (OT) on ESWDS. Complete program documentation and transition to production.</p>					
<p>Title: Containerized Ice Making System (CIMS)</p> <p>Description: Develops an add-on ice making capability that automatically dispenses and seals 10 lbs bags at a rate of a minimum of 3,600 pounds of ice per day. This capability is based upon Army current operational requirements for ice which is four pounds per Soldier per day. This capability enables support for up to 900 personnel. Current operations require external support to provide personnel with ice for cooling drinking water in extremely arid environments. This capability will reduce the sustainment risk and cost associated with transporting this commodity from external sources. The objective requirement enables stockage of ice to assist with surge operations.</p> <p>FY 2017 Plans: Develop programmatic documentation, specification and contract solicitation and transition the CIMS to production.</p> <p>FY 2018 Base Plans: Develop programmatic documentation, specification and contract solicitation and transition to production.</p>	-	0.350	0.400	-	0.400
<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>	-	0.660	-	-	-

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army				Date: May 2017	
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>		Project (Number/Name) VR7 / <i>Combat Service Support Systems</i>	
B. Accomplishments/Planned Programs (\$ in Millions)					
FY 2017 Plans: Procure test prototypes and initiate Development Testing (DT) of the black waste elimination system.					
Title: Ultralightweight Camouflage Net System (ULCANS)					
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).					
FY 2016 Accomplishments: Initiated pre-milestone (MS) B activities and support to Army Requirements Oversight Council (AROC) decision briefing to address ULCANS technology readiness, program affordability and Army procurement strategies. Obtained MDA approval to conduct pre-MS B efforts to include market research, specific analyses, and evaluations to support performance specification development and development contract planning/preparations. Conducted evaluation in the field and laboratory conditions of camouflage systems in specific environment types and conducted terrain analysis and full spectrum background matching evaluations in order to inform the performance specification.					
Title: Army Standard Family of Rigid Wall Shelters (ASF-RWS)					
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					
	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
	2.500	-	-	-	-
	-	-	0.838	-	0.838

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Exhibit R-2A, RDT&E Project Justification: FY 2018 Army		Date: May 2017
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604804A / <i>Logistics and Engineer Equipment - Eng Dev</i>	Project (Number/Name) VR7 / <i>Combat Service Support Systems</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
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.					
<i>FY 2018 Base Plans:</i> Award EMD contract and procure test items for Vehicle Mounted RWS Variants.					
Accomplishments/Planned Programs Subtotals	5.346	4.325	3.743	-	3.743

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>
• 643804 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

Remarks

D. Acquisition Strategy

Accelerate product development and testing to transition into production.

E. Performance Metrics

N/A

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