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**Department of Defense
Fiscal Year (FY) 2019 Budget Estimates**

February 2018



Army

Justification Book of

Research, Development, Test & Evaluation, Army

RDT&E – Volume II, Budget Activity 5B

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Army • Budget Estimates FY 2019 • RDT&E Program

Table of Contents

Introduction and Explanation of Contents..... ii

Comptroller Exhibit R-1..... iii

Program Element Table of Contents (by Budget Activity then Line Item Number)..... Ivii

Program Element Table of Contents (Alphabetically by Program Element Title)..... lx

Summary.....lxiii

Exhibit R-2's..... 1

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, \$10,484,483,000.00 to remain available for obligation until September 30, 2020.

The following Justification Books were prepared at a cost of \$226,413: 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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Department of Defense
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

<u>Appropriation</u>	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO
Research, Development, Test & Eval, Army	8,852,507	8,273,447	8,273,447	342,356	342,356
Total Research, Development, Test & Evaluation	8,852,507	8,273,447	8,273,447	342,356	342,356

UNCLASSIFIED

Department of Defense
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

Appropriation	FY 2018	FY 2018	FY 2018	FY 2018	FY 2018	
	Emergency Requests**	Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	Remaining Req Emergency	Total PB Requests* with CR Adj Base + OCO + Emergency**	Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	Remaining Req with CR Adj Base + OCO + Emergency
Research, Development, Test & Eval, Army	20,700	-20,700		8,636,503	-20,700	8,615,803
Total Research, Development, Test & Evaluation	20,700	-20,700		8,636,503	-20,700	8,615,803

UNCLASSIFIED

Department of Defense
FY 2019 President's Budget
Exhibit R-1 FY 2019 President's Budget
Total Obligational Authority
(Dollars in Thousands)

18 Jan 2018

<u>Appropriation</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Research, Development, Test & Eval, Army	10,159,379	325,104	10,484,483
Total Research, Development, Test & Evaluation	10,159,379	325,104	10,484,483

UNCLASSIFIED

Department of Defense
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests* with CR Adj OCO
<u>Summary Recap of Budget Activities</u>					
Basic Research	473,216	430,022	430,022		
Applied Research	1,196,132	889,182	889,182		
Advanced Technology Development	1,351,035	1,070,977	1,070,977		
Advanced Component Development & Prototypes	619,976	890,889	890,889	18,000	18,000
System Development & Demonstration	2,502,560	3,012,840	3,012,840	57,840	57,840
RDT&E Management Support	1,413,481	1,253,845	1,253,845		
Operational Systems Development	1,296,107	1,877,685	1,877,685	43,528	43,528
Undistributed		-1,151,993	-1,151,993	222,988	222,988
Total Research, Development, Test & Evaluation	8,852,507	8,273,447	8,273,447	342,356	342,356
<u>Summary Recap of FYDP Programs</u>					
General Purpose Forces	611,072	710,401	710,401	15,000	15,000
Intelligence and Communications	342,648	370,519	370,519	29,728	29,728
Research and Development	7,826,372	8,215,942	8,215,942	74,640	74,640
Central Supply and Maintenance	59,891	60,877	60,877		
Administration and Associated Activities	7,899	-1,151,993	-1,151,993	222,988	222,988
Space		60,547	60,547		
Classified Programs	4,625	7,154	7,154		
Total Research, Development, Test & Evaluation	8,852,507	8,273,447	8,273,447	342,356	342,356

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page iii

vi

UNCLASSIFIED

Department of Defense
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency
<u>Summary Recap of Budget Activities</u>						
Basic Research				430,022		430,022
Applied Research				889,182		889,182
Advanced Technology Development	12,000	-12,000		1,082,977	-12,000	1,070,977
Advanced Component Development & Prototypes	8,700	-8,700		917,589	-8,700	908,889
System Development & Demonstration				3,070,680		3,070,680
RDT&E Management Support				1,253,845		1,253,845
Operational Systems Development				1,921,213		1,921,213
Undistributed				-929,005		-929,005
Total Research, Development, Test & Evaluation	20,700	-20,700		8,636,503	-20,700	8,615,803
<u>Summary Recap of FYDP Programs</u>						
General Purpose Forces				725,401		725,401
Intelligence and Communications				400,247		400,247
Research and Development	20,700	-20,700		8,311,282	-20,700	8,290,582
Central Supply and Maintenance				60,877		60,877
Administration and Associated Activities				-929,005		-929,005
Space				60,547		60,547
Classified Programs				7,154		7,154
Total Research, Development, Test & Evaluation	20,700	-20,700		8,636,503	-20,700	8,615,803

UNCLASSIFIED

Department of Defense
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

Summary Recap of Budget Activities	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Basic Research	445,895		445,895
Applied Research	919,609		919,609
Advanced Technology Development	1,026,698		1,026,698
Advanced Component Development & Prototypes	1,329,393	28,500	1,357,893
System Development & Demonstration	3,192,689	236,863	3,429,552
RDT&E Management Support	1,322,481		1,322,481
Operational Systems Development	1,922,614	59,741	1,982,355
Undistributed			
Total Research, Development, Test & Evaluation	10,159,379	325,104	10,484,483
Summary Recap of FYDP Programs			
General Purpose Forces	783,464	10,000	793,464
Intelligence and Communications	313,112	40,613	353,725
Research and Development	8,775,582	274,491	9,050,073
Central Supply and Maintenance	53,958		53,958
Administration and Associated Activities			
Space	227,308		227,308
Classified Programs	5,955		5,955
Total Research, Development, Test & Evaluation	10,159,379	325,104	10,484,483

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Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO
<u>Summary Recap of Budget Activities</u>					
Basic Research	473,216	430,022	430,022		
Applied Research	1,196,132	889,182	889,182		
Advanced Technology Development	1,351,035	1,070,977	1,070,977		
Advanced Component Development & Prototypes	619,976	890,889	890,889	18,000	18,000
System Development & Demonstration	2,502,560	3,012,840	3,012,840	57,840	57,840
RDT&E Management Support	1,413,481	1,253,845	1,253,845		
Operational Systems Development	1,296,107	1,877,685	1,877,685	43,528	43,528
Undistributed		-1,151,993	-1,151,993	222,988	222,988
Total Research, Development, Test & Evaluation	8,852,507	8,273,447	8,273,447	342,356	342,356
<u>Summary Recap of FYDP Programs</u>					
General Purpose Forces	611,072	710,401	710,401	15,000	15,000
Intelligence and Communications	342,648	370,519	370,519	29,728	29,728
Research and Development	7,826,372	8,215,942	8,215,942	74,640	74,640
Central Supply and Maintenance	59,891	60,877	60,877		
Administration and Associated Activities	7,899	-1,151,993	-1,151,993	222,988	222,988
Space		60,547	60,547		
Classified Programs	4,625	7,154	7,154		
Total Research, Development, Test & Evaluation	8,852,507	8,273,447	8,273,447	342,356	342,356

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-1

ix

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

	FY 2018 Emergency Requests** Emergency	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency
<u>Summary Recap of Budget Activities</u>						
Basic Research				430,022		430,022
Applied Research				889,182		889,182
Advanced Technology Development	12,000	-12,000		1,082,977	-12,000	1,070,977
Advanced Component Development & Prototypes	8,700	-8,700		917,589	-8,700	908,889
System Development & Demonstration				3,070,680		3,070,680
RDT&E Management Support				1,253,845		1,253,845
Operational Systems Development				1,921,213		1,921,213
Undistributed				-929,005		-929,005
Total Research, Development, Test & Evaluation	20,700	-20,700		8,636,503	-20,700	8,615,803
<u>Summary Recap of FYDP Programs</u>						
General Purpose Forces				725,401		725,401
Intelligence and Communications				400,247		400,247
Research and Development	20,700	-20,700		8,311,282	-20,700	8,290,582
Central Supply and Maintenance				60,877		60,877
Administration and Associated Activities				-929,005		-929,005
Space				60,547		60,547
Classified Programs				7,154		7,154
Total Research, Development, Test & Evaluation	20,700	-20,700		8,636,503	-20,700	8,615,803

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-1A

x

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

<u>Summary Recap of Budget Activities</u>	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Basic Research	445,895		445,895
Applied Research	919,609		919,609
Advanced Technology Development	1,026,698		1,026,698
Advanced Component Development & Prototypes	1,329,393	28,500	1,357,893
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Operational Systems Development	1,922,614	59,741	1,982,355
Undistributed			
Total Research, Development, Test & Evaluation	10,159,379	325,104	10,484,483
 <u>Summary Recap of FYDP Programs</u>			
General Purpose Forces	783,464	10,000	793,464
Intelligence and Communications	313,112	40,613	353,725
Research and Development	8,775,582	274,491	9,050,073
Central Supply and Maintenance	53,958		53,958
Administration and Associated Activities			
Space	227,308		227,308
Classified Programs	5,955		5,955
Total Research, Development, Test & Evaluation	10,159,379	325,104	10,484,483

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-1B

xi

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
1	0601101A	In-House Laboratory Research	01	11,936	12,010	12,010			U
2	0601102A	Defense Research Sciences	01	286,086	263,590	263,590			U
3	0601103A	University Research Initiatives	01	66,506	67,027	67,027			U
4	0601104A	University and Industry Research Centers	01	108,688	87,395	87,395			U
		Basic Research		473,216	430,022	430,022			
5	0602105A	Materials Technology	02	81,950	29,640	29,640			U
6	0602120A	Sensors and Electronic Survivability	02	50,574	35,730	35,730			U
7	0602122A	TRACTOR HIP	02	6,995	8,627	8,627			U
8	0602126A	TRACTOR JACK	02						U
9	0602211A	Aviation Technology	02	67,593	66,086	66,086			U
10	0602270A	Electronic Warfare Technology	02	34,528	27,144	27,144			U
11	0602303A	Missile Technology	02	66,173	43,742	43,742			U
12	0602307A	Advanced Weapons Technology	02	52,766	22,785	22,785			U
13	0602308A	Advanced Concepts and Simulation	02	29,767	28,650	28,650			U
14	0602601A	Combat Vehicle and Automotive Technology	02	89,852	67,232	67,232			U
15	0602618A	Ballistics Technology	02	103,484	85,309	85,309			U
16	0602622A	Chemical, Smoke and Equipment Defeating Technology	02	3,772	4,004	4,004			U
17	0602623A	Joint Service Small Arms Program	02	5,331	5,615	5,615			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018	FY 2018	FY 2018	FY 2018	FY 2018	S	
				Emergency Requests**	Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	Emergency Remaining Req	Total PB Requests* with CR Adj Base + OCO + Emergency**	Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs		Remaining Req with CR Adj Base + OCO + Emergency
1	0601101A	In-House Laboratory Independent Research	01					12,010	12,010	U
2	0601102A	Defense Research Sciences	01					263,590	263,590	U
3	0601103A	University Research Initiatives	01					67,027	67,027	U
4	0601104A	University and Industry Research Centers	01					87,395	87,395	U
		Basic Research						430,022	430,022	
5	0602105A	Materials Technology	02					29,640	29,640	U
6	0602120A	Sensors and Electronic Survivability	02					35,730	35,730	U
7	0602122A	TRACTOR HIP	02					8,627	8,627	U
8	0602126A	TRACTOR JACK	02							U
9	0602211A	Aviation Technology	02					66,086	66,086	U
10	0602270A	Electronic Warfare Technology	02					27,144	27,144	U
11	0602303A	Missile Technology	02					43,742	43,742	U
12	0602307A	Advanced Weapons Technology	02					22,785	22,785	U
13	0602308A	Advanced Concepts and Simulation	02					28,650	28,650	U
14	0602601A	Combat Vehicle and Automotive Technology	02					67,232	67,232	U
15	0602618A	Ballistics Technology	02					85,309	85,309	U
16	0602622A	Chemical, Smoke and Equipment Defeating Technology	02					4,004	4,004	U
17	0602623A	Joint Service Small Arms Program	02					5,615	5,615	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
1	0601101A	In-House Laboratory Independent Research	01	11,585		11,585	U
2	0601102A	Defense Research Sciences	01	276,912		276,912	U
3	0601103A	University Research Initiatives	01	65,283		65,283	U
4	0601104A	University and Industry Research Centers	01	92,115		92,115	U
		Basic Research		445,895		445,895	
5	0602105A	Materials Technology	02	28,600		28,600	U
6	0602120A	Sensors and Electronic Survivability	02	32,366		32,366	U
7	0602122A	TRACTOR HIP	02	8,674		8,674	U
8	0602126A	TRACTOR JACK	02	400		400	U
9	0602211A	Aviation Technology	02	64,847		64,847	U
10	0602270A	Electronic Warfare Technology	02	25,571		25,571	U
11	0602303A	Missile Technology	02	50,183		50,183	U
12	0602307A	Advanced Weapons Technology	02	29,502		29,502	U
13	0602308A	Advanced Concepts and Simulation	02	28,500		28,500	U
14	0602601A	Combat Vehicle and Automotive Technology	02	70,450		70,450	U
15	0602618A	Ballistics Technology	02	75,541		75,541	U
16	0602622A	Chemical, Smoke and Equipment Defeating Technology	02	5,032		5,032	U
17	0602623A	Joint Service Small Arms Program	02	12,394		12,394	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests* with CR Adj OCO	S e c
18	0602624A	Weapons and Munitions Technology	02	118,068	41,455	41,455			U
19	0602705A	Electronics and Electronic Devices	02	72,979	58,352	58,352			U
20	0602709A	Night Vision Technology	02	34,762	34,723	34,723			U
21	0602712A	Countermines Systems	02	29,495	26,190	26,190			U
22	0602716A	Human Factors Engineering Technology	02	23,359	24,127	24,127			U
23	0602720A	Environmental Quality Technology	02	21,553	21,678	21,678			U
24	0602782A	Command, Control, Communications Technology	02	36,396	33,123	33,123			U
25	0602783A	Computer and Software Technology	02	13,452	14,041	14,041			U
26	0602784A	Military Engineering Technology	02	92,140	67,720	67,720			U
27	0602785A	Manpower/Personnel/Training Technology	02	23,475	20,216	20,216			U
28	0602786A	Warfighter Technology	02	59,327	39,559	39,559			U
29	0602787A	Medical Technology	02	78,341	83,434	83,434			U
		Applied Research		1,196,132	889,182	889,182			
30	0603001A	Warfighter Advanced Technology	03	50,004	44,863	44,863			U
31	0603002A	Medical Advanced Technology	03	106,040	67,780	67,780			U
32	0603003A	Aviation Advanced Technology	03	111,654	160,746	160,746			U
33	0603004A	Weapons and Munitions Advanced Technology	03	198,245	84,079	84,079			U
34	0603005A	Combat Vehicle and Automotive Advanced Technology	03	163,501	125,537	125,537			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S e c
18	0602624A	Weapons and Munitions Technology	02				41,455		41,455	U
19	0602705A	Electronics and Electronic Devices	02				58,352		58,352	U
20	0602709A	Night Vision Technology	02				34,723		34,723	U
21	0602712A	Countermine Systems	02				26,190		26,190	U
22	0602716A	Human Factors Engineering Technology	02				24,127		24,127	U
23	0602720A	Environmental Quality Technology	02				21,678		21,678	U
24	0602782A	Command, Control, Communications Technology	02				33,123		33,123	U
25	0602783A	Computer and Software Technology	02				14,041		14,041	U
26	0602784A	Military Engineering Technology	02				67,720		67,720	U
27	0602785A	Manpower/Personnel/Training Technology	02				20,216		20,216	U
28	0602786A	Warfighter Technology	02				39,559		39,559	U
29	0602787A	Medical Technology	02				83,434		83,434	U
	Applied Research						889,182		889,182	
30	0603001A	Warfighter Advanced Technology	03				44,863		44,863	U
31	0603002A	Medical Advanced Technology	03				67,780		67,780	U
32	0603003A	Aviation Advanced Technology	03				160,746		160,746	U
33	0603004A	Weapons and Munitions Advanced Technology	03				84,079		84,079	U
34	0603005A	Combat Vehicle and Automotive Advanced Technology	03				125,537		125,537	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
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Appropriation: 2040A Research, Development, Test & Eval, Army

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se c
18	0602624A	Weapons and Munitions Technology	02	40,444		40,444	U
19	0602705A	Electronics and Electronic Devices	02	58,283		58,283	U
20	0602709A	Night Vision Technology	02	29,582		29,582	U
21	0602712A	Countermine Systems	02	21,244		21,244	U
22	0602716A	Human Factors Engineering Technology	02	24,131		24,131	U
23	0602720A	Environmental Quality Technology	02	13,242		13,242	U
24	0602782A	Command, Control, Communications Technology	02	55,003		55,003	U
25	0602783A	Computer and Software Technology	02	14,958		14,958	U
26	0602784A	Military Engineering Technology	02	78,159		78,159	U
27	0602785A	Manpower/Personnel/Training Technology	02	21,862		21,862	U
28	0602786A	Warfighter Technology	02	40,566		40,566	U
29	0602787A	Medical Technology	02	90,075		90,075	U
		Applied Research		919,609		919,609	
30	0603001A	Warfighter Advanced Technology	03	39,338		39,338	U
31	0603002A	Medical Advanced Technology	03	62,496		62,496	U
32	0603003A	Aviation Advanced Technology	03	124,958		124,958	U
33	0603004A	Weapons and Munitions Advanced Technology	03	102,686		102,686	U
34	0603005A	Combat Vehicle and Automotive Advanced Technology	03	119,739		119,739	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
35	0603006A	Space Application Advanced Technology	03	3,787	12,231	12,231			U
36	0603007A	Manpower, Personnel and Training Advanced Technology	03	12,110	6,466	6,466			U
37	0603009A	TRACTOR HIKE	03	21,374	28,552	28,552			U
38	0603015A	Next Generation Training & Simulation Systems	03	18,238	16,434	16,434			U
39	0603020A	TRACTOR ROSE	03	11,910					U
40	0603125A	Combating Terrorism - Technology Development	03	33,553	26,903	26,903			U
41	0603130A	TRACTOR NAIL	03	2,340	4,880	4,880			U
42	0603131A	TRACTOR EGGS	03	2,470	4,326	4,326			U
43	0603270A	Electronic Warfare Technology	03	40,819	31,296	31,296			U
44	0603313A	Missile and Rocket Advanced Technology	03	113,683	62,850	62,850			U
45	0603322A	TRACTOR CAGE	03	11,107	12,323	12,323			U
46	0603461A	High Performance Computing Modernization Program	03	215,462	182,331	182,331			U
47	0603606A	Landmine Warfare and Barrier Advanced Technology	03	16,798	17,948	17,948			U
48	0603607A	Joint Service Small Arms Program	03	5,615	5,796	5,796			U
49	0603710A	Night Vision Advanced Technology	03	42,798	47,135	47,135			U
50	0603728A	Environmental Quality Technology Demonstrations	03	21,415	10,421	10,421			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S
35	0603006A	Space Application Advanced Technology	03				12,231		12,231	U
36	0603007A	Manpower, Personnel and Training Advanced Technology	03				6,466		6,466	U
37	0603009A	TRACTOR HIKE	03	12,000	-12,000		40,552	-12,000	28,552	U
38	0603015A	Next Generation Training & Simulation Systems	03				16,434		16,434	U
39	0603020A	TRACTOR ROSE	03							U
40	0603125A	Combating Terrorism - Technology Development	03				26,903		26,903	U
41	0603130A	TRACTOR NAIL	03				4,880		4,880	U
42	0603131A	TRACTOR EGGS	03				4,326		4,326	U
43	0603270A	Electronic Warfare Technology	03				31,296		31,296	U
44	0603313A	Missile and Rocket Advanced Technology	03				62,850		62,850	U
45	0603322A	TRACTOR CAGE	03				12,323		12,323	U
46	0603461A	High Performance Computing Modernization Program	03				182,331		182,331	U
47	0603606A	Landmine Warfare and Barrier Advanced Technology	03				17,948		17,948	U
48	0603607A	Joint Service Small Arms Program	03				5,796		5,796	U
49	0603710A	Night Vision Advanced Technology	03				47,135		47,135	U
50	0603728A	Environmental Quality Technology Demonstrations	03				10,421		10,421	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
35	0603006A	Space Application Advanced Technology	03	13,000		13,000	U
36	0603007A	Manpower, Personnel and Training Advanced Technology	03	8,044		8,044	U
37	0603009A	TRACTOR HIKE	03	22,631		22,631	U
38	0603015A	Next Generation Training & Simulation Systems	03	25,682		25,682	U
39	0603020A	TRACTOR ROSE	03				U
40	0603125A	Combating Terrorism - Technology Development	03	3,762		3,762	U
41	0603130A	TRACTOR NAIL	03	4,896		4,896	U
42	0603131A	TRACTOR EGGS	03	6,041		6,041	U
43	0603270A	Electronic Warfare Technology	03	31,491		31,491	U
44	0603313A	Missile and Rocket Advanced Technology	03	61,132		61,132	U
45	0603322A	TRACTOR CAGE	03	16,845		16,845	U
46	0603461A	High Performance Computing Modernization Program	03	183,322		183,322	U
47	0603606A	Landmine Warfare and Barrier Advanced Technology	03	11,104		11,104	U
48	0603607A	Joint Service Small Arms Program	03	5,885		5,885	U
49	0603710A	Night Vision Advanced Technology	03	61,376		61,376	U
50	0603728A	Environmental Quality Technology Demonstrations	03	9,136		9,136	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-4B

XX

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests* with CR Adj OCO	S e c
51	0603734A	Military Engineering Advanced Technology	03	59,101	32,448	32,448			U
52	0603772A	Advanced Tactical Computer Science and Sensor Technology	03	52,572	52,206	52,206			U
53	0603794A	C3 Advanced Technology	03	36,439	33,426	33,426			U
		Advanced Technology Development		1,351,035	1,070,977	1,070,977			
54	0603305A	Army Missile Defense Systems Integration	04	39,395	9,634	9,634			U
55	0603308A	Army Space Systems Integration	04	32,278					U
56	0603327A	Air and Missile Defense Systems Engineering	04	6,100	33,949	33,949	15,000	15,000	U
57	0603619A	Landmine Warfare and Barrier - Adv Dev	04	65,062	72,909	72,909			U
58	0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04	43,177	7,135	7,135			U
59	0603639A	Tank and Medium Caliber Ammunition	04	47,745	41,452	41,452			U
60	0603645A	Armored System Modernization - Adv Dev	04		32,739	32,739			U
61	0603747A	Soldier Support and Survivability	04	13,607	10,157	10,157	3,000	3,000	U
62	0603766A	Tactical Electronic Surveillance System - Adv Dev	04	15,730	27,733	27,733			U
63	0603774A	Night Vision Systems Advanced Development	04	9,930	12,347	12,347			U
64	0603779A	Environmental Quality Technology - Dem/Val	04	7,480	10,456	10,456			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018	FY 2018	FY 2018	FY 2018	FY 2018	S	
				Emergency Requests**	Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	Remaining Req	Total PB Requests* with CR Adj Base + OCO + Emergency**	Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs		Remaining Req with CR Adj Base + OCO + Emergency
51	0603734A	Military Engineering Advanced Technology	03				32,448		32,448	U
52	0603772A	Advanced Tactical Computer Science and Sensor Technology	03				52,206		52,206	U
53	0603794A	C3 Advanced Technology	03				33,426		33,426	U
		Advanced Technology Development		12,000	-12,000		1,082,977	-12,000	1,070,977	
54	0603305A	Army Missile Defense Systems Integration	04				9,634		9,634	U
55	0603308A	Army Space Systems Integration	04							U
56	0603327A	Air and Missile Defense Systems Engineering	04	8,700	-8,700		57,649	-8,700	48,949	U
57	0603619A	Landmine Warfare and Barrier - Adv Dev	04				72,909		72,909	U
58	0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04				7,135		7,135	U
59	0603639A	Tank and Medium Caliber Ammunition	04				41,452		41,452	U
60	0603645A	Armored System Modernization - Adv Dev	04				32,739		32,739	U
61	0603747A	Soldier Support and Survivability	04				13,157		13,157	U
62	0603766A	Tactical Electronic Surveillance System - Adv Dev	04				27,733		27,733	U
63	0603774A	Night Vision Systems Advanced Development	04				12,347		12,347	U
64	0603779A	Environmental Quality Technology - Dem/Val	04				10,456		10,456	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se c
51	0603734A	Military Engineering Advanced Technology	03	25,864		25,864	U
52	0603772A	Advanced Tactical Computer Science and Sensor Technology	03	34,883		34,883	U
53	0603794A	C3 Advanced Technology	03	52,387		52,387	U
		Advanced Technology Development		1,026,698		1,026,698	
54	0603305A	Army Missile Defense Systems Integration	04	10,777		10,777	U
55	0603308A	Army Space Systems Integration	04				U
56	0603327A	Air and Missile Defense Systems Engineering	04	42,802	1,000	43,802	U
57	0603619A	Landmine Warfare and Barrier - Adv Dev	04	45,254		45,254	U
58	0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04	22,700	1,500	24,200	U
59	0603639A	Tank and Medium Caliber Ammunition	04	41,974		41,974	U
60	0603645A	Armored System Modernization - Adv Dev	04	119,395		119,395	U
61	0603747A	Soldier Support and Survivability	04	8,746	3,000	11,746	U
62	0603766A	Tactical Electronic Surveillance System - Adv Dev	04	35,667		35,667	U
63	0603774A	Night Vision Systems Advanced Development	04	7,350		7,350	U
64	0603779A	Environmental Quality Technology - Dem/Val	04	14,749		14,749	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-5B

xxiii

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
65	0603790A	NATO Research and Development	04	2,211	2,588	2,588			U
66	0603801A	Aviation - Adv Dev	04	7,702	14,055	14,055			U
67	0603804A	Logistics and Engineer Equipment - Adv Dev	04	17,445	35,333	35,333			U
68	0603807A	Medical Systems - Adv Dev	04	47,336	33,491	33,491			U
69	0603827A	Soldier Systems - Advanced Development	04	54,497	20,239	20,239			U
70	0604017A	Robotics Development	04		39,608	39,608			U
71	0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping	04						U
72	0604100A	Analysis Of Alternatives	04	6,354	9,921	9,921			U
73	0604113A	Future Tactical Unmanned Aircraft System (FTUAS)	04						U
74	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04	33,780	76,728	76,728			U
75	0604115A	Technology Maturation Initiatives	04	57,737	115,221	115,221			U
76	0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04		20,000	20,000			U
77	0604118A	TRACTOR BEAM	04		10,400	10,400			U
78	0604120A	Assured Positioning, Navigation and Timing (PNT)	04	83,074	164,967	164,967			U
79	0604121A	Synthetic Training Environment Refinement & Prototyping	04		1,600	1,600			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S
65	0603790A	NATO Research and Development	04				2,588		2,588	U
66	0603801A	Aviation - Adv Dev	04				14,055		14,055	U
67	0603804A	Logistics and Engineer Equipment - Adv Dev	04				35,333		35,333	U
68	0603807A	Medical Systems - Adv Dev	04				33,491		33,491	U
69	0603827A	Soldier Systems - Advanced Development	04				20,239		20,239	U
70	0604017A	Robotics Development	04				39,608		39,608	U
71	0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping	04							U
72	0604100A	Analysis Of Alternatives	04				9,921		9,921	U
73	0604113A	Future Tactical Unmanned Aircraft System (FTUAS)	04							U
74	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04				76,728		76,728	U
75	0604115A	Technology Maturation Initiatives	04				115,221		115,221	U
76	0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04				20,000		20,000	U
77	0604118A	TRACTOR BEAM	04				10,400		10,400	U
78	0604120A	Assured Positioning, Navigation and Timing (PNT)	04				164,967		164,967	U
79	0604121A	Synthetic Training Environment Refinement & Prototyping	04				1,600		1,600	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
65	0603790A	NATO Research and Development	04	3,687		3,687	U
66	0603801A	Aviation - Adv Dev	04	10,793		10,793	U
67	0603804A	Logistics and Engineer Equipment - Adv Dev	04	14,248		14,248	U
68	0603807A	Medical Systems - Adv Dev	04	34,284		34,284	U
69	0603827A	Soldier Systems - Advanced Development	04	18,044		18,044	U
70	0604017A	Robotics Development	04	95,660		95,660	U
71	0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping	04	38,000		38,000	U
72	0604100A	Analysis Of Alternatives	04	9,765		9,765	U
73	0604113A	Future Tactical Unmanned Aircraft System (FTUAS)	04	12,393		12,393	U
74	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04	120,374		120,374	U
75	0604115A	Technology Maturation Initiatives	04	95,347		95,347	U
76	0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04	95,085	23,000	118,085	U
77	0604118A	TRACTOR BEAM	04	52,894		52,894	U
78	0604120A	Assured Positioning, Navigation and Timing (PNT)	04				U
79	0604121A	Synthetic Training Environment Refinement & Prototyping	04	77,939		77,939	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-6B

xxvi

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests* with CR Adj OCO	S e c
80	0604319A	Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	04		11,303	11,303			U
81	0305251A	Cyberspace Operations Forces and Force Support	04	29,336	56,492	56,492			U
82	1206120A	Assured Positioning, Navigation and Timing (PNT)	04						U
83	1206308A	Army Space Systems Integration	04		20,432	20,432			U
		Advanced Component Development & Prototypes		619,976	890,889	890,889	18,000	18,000	
84	0604201A	Aircraft Avionics	05	54,915	30,153	30,153			U
85	0604270A	Electronic Warfare Development	05	33,419	71,671	71,671			U
86	0604290A	Mid-tier Networking Vehicular Radio (MNVR)	05	9,363	10,589	10,589			U
87	0604321A	All Source Analysis System	05	11,958	4,774	4,774			U
88	0604328A	TRACTOR CAGE	05	12,525	17,252	17,252			U
89	0604601A	Infantry Support Weapons	05	63,842	87,643	87,643			U
90	0604604A	Medium Tactical Vehicles	05		6,039	6,039			U
91	0604611A	JAVELIN	05	19,241	21,095	21,095			U
92	0604622A	Family of Heavy Tactical Vehicles	05	10,989	10,507	10,507			U
93	0604633A	Air Traffic Control	05	3,326	3,536	3,536			U
94	0604641A	Tactical Unmanned Ground Vehicle (TUGV)	05	32,315					U
95	0604642A	Light Tactical Wheeled Vehicles	05	476	7,000	7,000			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018	FY 2018	FY 2018	FY 2018	FY 2018	S	
				Emergency Requests**	Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	Remaining Req Emergency	Total PB Requests* with CR Adj Base + OCO + Emergency**	Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs		Remaining Req with CR Adj Base + OCO + Emergency
80	0604319A	Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	04				11,303		11,303	U
81	0305251A	Cyberspace Operations Forces and Force Support	04				56,492		56,492	U
82	1206120A	Assured Positioning, Navigation and Timing (PNT)	04							U
83	1206308A	Army Space Systems Integration	04				20,432		20,432	U
	Advanced Component Development & Prototypes			8,700	-8,700		917,589	-8,700	908,889	
84	0604201A	Aircraft Avionics	05				30,153		30,153	U
85	0604270A	Electronic Warfare Development	05				71,671		71,671	U
86	0604290A	Mid-tier Networking Vehicular Radio (MNVR)	05				10,589		10,589	U
87	0604321A	All Source Analysis System	05				4,774		4,774	U
88	0604328A	TRACTOR CAGE	05				17,252		17,252	U
89	0604601A	Infantry Support Weapons	05				87,643		87,643	U
90	0604604A	Medium Tactical Vehicles	05				6,039		6,039	U
91	0604611A	JAVELIN	05				21,095		21,095	U
92	0604622A	Family of Heavy Tactical Vehicles	05				10,507		10,507	U
93	0604633A	Air Traffic Control	05				3,536		3,536	U
94	0604641A	Tactical Unmanned Ground Vehicle (TUGV)	05							U
95	0604642A	Light Tactical Wheeled Vehicles	05				7,000		7,000	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
80	0604319A	Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	04	51,030		51,030	U
81	0305251A	Cyberspace Operations Forces and Force Support	04	65,817		65,817	U
82	1206120A	Assured Positioning, Navigation and Timing (PNT)	04	146,300		146,300	U
83	1206308A	Army Space Systems Integration	04	38,319		38,319	U
	Advanced Component Development & Prototypes			1,329,393	28,500	1,357,893	
84	0604201A	Aircraft Avionics	05	32,293		32,293	U
85	0604270A	Electronic Warfare Development	05	78,699		78,699	U
86	0604290A	Mid-tier Networking Vehicular Radio (MNVR)	05				U
87	0604321A	All Source Analysis System	05				U
88	0604328A	TRACTOR CAGE	05	17,050	12,000	29,050	U
89	0604601A	Infantry Support Weapons	05	83,155		83,155	U
90	0604604A	Medium Tactical Vehicles	05	3,704		3,704	U
91	0604611A	JAVELIN	05	10,623		10,623	U
92	0604622A	Family of Heavy Tactical Vehicles	05	11,950		11,950	U
93	0604633A	Air Traffic Control	05	12,347		12,347	U
94	0604641A	Tactical Unmanned Ground Vehicle (TUGV)	05				U
95	0604642A	Light Tactical Wheeled Vehicles	05	8,212		8,212	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
96	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05	9,306	36,242	36,242			U
97	0604710A	Night Vision Systems - Eng Dev	05	76,491	108,504	108,504			U
98	0604713A	Combat Feeding, Clothing, and Equipment	05	1,975	3,702	3,702			U
99	0604715A	Non-System Training Devices - Eng Dev	05	33,888	43,575	43,575			U
100	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	200,205	28,726	28,726			U
101	0604742A	Constructive Simulation Systems Development	05	17,363	18,562	18,562			U
102	0604746A	Automatic Test Equipment Development	05	8,503	8,344	8,344			U
103	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05	10,150	11,270	11,270			U
104	0604768A	Brilliant Anti-Armor Submunition (BAT)	05		10,000	10,000			U
105	0604780A	Combined Arms Tactical Trainer (CATT) Core	05	14,538	18,566	18,566			U
106	0604798A	Brigade Analysis, Integration and Evaluation	05	101,927	145,360	145,360			U
107	0604802A	Weapons and Munitions - Eng Dev	05	75,845	145,232	145,232			U
108	0604804A	Logistics and Engineer Equipment - Eng Dev	05	76,374	90,965	90,965			U
109	0604805A	Command, Control, Communications Systems - Eng Dev	05	4,166	9,910	9,910			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S
96	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05				36,242		36,242	U
97	0604710A	Night Vision Systems - Eng Dev	05				108,504		108,504	U
98	0604713A	Combat Feeding, Clothing, and Equipment	05				3,702		3,702	U
99	0604715A	Non-System Training Devices - Eng Dev	05				43,575		43,575	U
100	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05				28,726		28,726	U
101	0604742A	Constructive Simulation Systems Development	05				18,562		18,562	U
102	0604746A	Automatic Test Equipment Development	05				8,344		8,344	U
103	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05				11,270		11,270	U
104	0604768A	Brilliant Anti-Armor Submunition (BAT)	05				10,000		10,000	U
105	0604780A	Combined Arms Tactical Trainer (CATT) Core	05				18,566		18,566	U
106	0604798A	Brigade Analysis, Integration and Evaluation	05				145,360		145,360	U
107	0604802A	Weapons and Munitions - Eng Dev	05				145,232		145,232	U
108	0604804A	Logistics and Engineer Equipment - Eng Dev	05				90,965		90,965	U
109	0604805A	Command, Control, Communications Systems - Eng Dev	05				9,910		9,910	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
96	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05	393,613		393,613	U
97	0604710A	Night Vision Systems - Eng Dev	05	139,614		139,614	U
98	0604713A	Combat Feeding, Clothing, and Equipment	05	4,507		4,507	U
99	0604715A	Non-System Training Devices - Eng Dev	05	49,436		49,436	U
100	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	95,172	119,300	214,472	U
101	0604742A	Constructive Simulation Systems Development	05	22,628		22,628	U
102	0604746A	Automatic Test Equipment Development	05	13,297		13,297	U
103	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05	9,145		9,145	U
104	0604768A	Brilliant Anti-Armor Submunition (BAT)	05	9,894		9,894	U
105	0604780A	Combined Arms Tactical Trainer (CATT) Core	05	21,964		21,964	U
106	0604798A	Brigade Analysis, Integration and Evaluation	05	49,288		49,288	U
107	0604802A	Weapons and Munitions - Eng Dev	05	183,100		183,100	U
108	0604804A	Logistics and Engineer Equipment - Eng Dev	05	79,706		79,706	U
109	0604805A	Command, Control, Communications Systems - Eng Dev	05	15,970		15,970	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c e
110	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05	36,237	39,238	39,238			U
111	0604808A	Landmine Warfare/Barrier - Eng Dev	05	32,069	34,684	34,684			U
112	0604818A	Army Tactical Command & Control Hardware & Software	05	169,375	164,409	164,409			U
113	0604820A	Radar Development	05	15,368	32,968	32,968			U
114	0604822A	General Fund Enterprise Business System (GFEBs)	05	11,044	49,554	49,554			U
115	0604823A	Firefinder	05	6,177	45,605	45,605			U
116	0604827A	Soldier Systems - Warrior Dem/Val	05	11,929	16,127	16,127			U
117	0604852A	Suite of Survivability Enhancement Systems - EMD	05		98,600	98,600			U
118	0604854A	Artillery Systems - EMD	05	1,689	1,972	1,972			U
119	0605013A	Information Technology Development	05	70,104	81,776	81,776			U
120	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05	149,597	172,361	172,361			U
121	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05	177,133	199,778	199,778			U
122	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05	4,789	4,418	4,418			U
123	0605030A	Joint Tactical Network Center (JTNC)	05	14,463	15,877	15,877			U
124	0605031A	Joint Tactical Network (JTN)	05	16,430	44,150	44,150			U
125	0605032A	TRACTOR TIRE	05	27,254	34,670	34,670	5,000	5,000	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018	FY 2018	FY 2018	FY 2018	FY 2018	S	
				Emergency Requests**	Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	Remaining Req	Total PB Requests* with CR Adj Base + OCO + Emergency**	Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs		Remaining Req with CR Adj Base + OCO + Emergency
110	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05				39,238		39,238	U
111	0604808A	Landmine Warfare/Barrier - Eng Dev	05				34,684		34,684	U
112	0604818A	Army Tactical Command & Control Hardware & Software	05				164,409		164,409	U
113	0604820A	Radar Development	05				32,968		32,968	U
114	0604822A	General Fund Enterprise Business System (GFEBS)	05				49,554		49,554	U
115	0604823A	Firefinder	05				45,605		45,605	U
116	0604827A	Soldier Systems - Warrior Dem/Val	05				16,127		16,127	U
117	0604852A	Suite of Survivability Enhancement Systems - EMD	05				98,600		98,600	U
118	0604854A	Artillery Systems - EMD	05				1,972		1,972	U
119	0605013A	Information Technology Development	05				81,776		81,776	U
120	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05				172,361		172,361	U
121	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05				199,778		199,778	U
122	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05				4,418		4,418	U
123	0605030A	Joint Tactical Network Center (JTNC)	05				15,877		15,877	U
124	0605031A	Joint Tactical Network (JTN)	05				44,150		44,150	U
125	0605032A	TRACTOR TIRE	05				39,670		39,670	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
110	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05	44,542		44,542	U
111	0604808A	Landmine Warfare/Barrier - Eng Dev	05	50,817		50,817	U
112	0604818A	Army Tactical Command & Control Hardware & Software	05	178,693		178,693	U
113	0604820A	Radar Development	05	39,338		39,338	U
114	0604822A	General Fund Enterprise Business System (GFEBs)	05	37,851		37,851	U
115	0604823A	Firefinder	05	45,473		45,473	U
116	0604827A	Soldier Systems - Warrior Dem/Val	05	10,395		10,395	U
117	0604852A	Suite of Survivability Enhancement Systems - EMD	05	69,204		69,204	U
118	0604854A	Artillery Systems - EMD	05	1,781		1,781	U
119	0605013A	Information Technology Development	05	113,758		113,758	U
120	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05	166,603		166,603	U
121	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05	118,239		118,239	U
122	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05	3,211		3,211	U
123	0605030A	Joint Tactical Network Center (JTNC)	05	15,889		15,889	U
124	0605031A	Joint Tactical Network (JTN)	05	41,972		41,972	U
125	0605032A	TRACTOR TIRE	05	41,166	66,760	107,926	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-9B

XXXV

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
126	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05	4,838	5,207	5,207			U
127	0605034A	Tactical Security System (TSS)	05	2,792	4,727	4,727			U
128	0605035A	Common Infrared Countermeasures (CIRCM)	05	90,685	105,778	105,778	21,540	21,540	U
129	0605036A	Combating Weapons of Mass Destruction (CWMD)	05	2,008	6,927	6,927			U
130	0605037A	Evidence Collection and Detainee Processing	05		214	214			U
131	0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite	05		16,125	16,125			U
132	0605041A	Defensive CYBER Tool Development	05	32,535	55,165	55,165			U
133	0605042A	Tactical Network Radio Systems (Low-Tier)	05	14,198	20,076	20,076			U
134	0605047A	Contract Writing System	05	19,868	20,322	20,322			U
135	0605049A	Missile Warning System Modernization (MWSM)	05		55,810	55,810			U
136	0605051A	Aircraft Survivability Development	05	121,530	30,879	30,879	30,100	30,100	U
137	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05	80,781	175,069	175,069			U
138	0605053A	Ground Robotics	05		70,760	70,760			U
139	0605054A	Emerging Technology Initiatives	05						U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018	FY 2018	FY 2018	FY 2018	FY 2018	S
				Emergency Requests**	Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	Remaining Req Emergency	Total PB Requests* with CR Adj Base + OCO + Emergency**	Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	
126	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05				5,207	5,207	U
127	0605034A	Tactical Security System (TSS)	05				4,727	4,727	U
128	0605035A	Common Infrared Countermeasures (CIRCM)	05				127,318	127,318	U
129	0605036A	Combating Weapons of Mass Destruction (CWMD)	05				6,927	6,927	U
130	0605037A	Evidence Collection and Detainee Processing	05				214	214	U
131	0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite	05				16,125	16,125	U
132	0605041A	Defensive CYBER Tool Development	05				55,165	55,165	U
133	0605042A	Tactical Network Radio Systems (Low-Tier)	05				20,076	20,076	U
134	0605047A	Contract Writing System	05				20,322	20,322	U
135	0605049A	Missile Warning System Modernization (MWSM)	05				55,810	55,810	U
136	0605051A	Aircraft Survivability Development	05				60,979	60,979	U
137	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05				175,069	175,069	U
138	0605053A	Ground Robotics	05				70,760	70,760	U
139	0605054A	Emerging Technology Initiatives	05						U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
126	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05	5,175		5,175	U
127	0605034A	Tactical Security System (TSS)	05	4,496		4,496	U
128	0605035A	Common Infrared Countermeasures (CIRCM)	05	51,178	2,670	53,848	U
129	0605036A	Combating Weapons of Mass Destruction (CWMD)	05	11,311		11,311	U
130	0605037A	Evidence Collection and Detainee Processing	05				U
131	0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite	05	17,154		17,154	U
132	0605041A	Defensive CYBER Tool Development	05	36,626		36,626	U
133	0605042A	Tactical Network Radio Systems (Low-Tier)	05	3,829		3,829	U
134	0605047A	Contract Writing System	05	41,928		41,928	U
135	0605049A	Missile Warning System Modernization (MWSM)	05	28,276		28,276	U
136	0605051A	Aircraft Survivability Development	05	21,965	34,933	56,898	U
137	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05	157,710		157,710	U
138	0605053A	Ground Robotics	05	86,167		86,167	U
139	0605054A	Emerging Technology Initiatives	05	42,866		42,866	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
140	0605380A	AMF Joint Tactical Radio System (JTRS)	05	4,088	8,965	8,965			U
141	0605450A	Joint Air-to-Ground Missile (JAGM)	05	47,446	34,626	34,626			U
142	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05	273,240	336,420	336,420			U
143	0605766A	National Capabilities Integration (MIP)	05	4,955	6,882	6,882			U
144	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	11,086	23,467	23,467			U
145	0605830A	Aviation Ground Support Equipment	05	2,060	6,930	6,930			U
146	0210609A	Paladin Integrated Management (PIM)	05	39,902	6,112	6,112			U
147	0303032A	TROJAN - RH12	05	4,273	4,431	4,431	1,200	1,200	U
148	0303267A	Auctioned Spectrum Relocation Fund	05	34,967					U
149	0303367A	Spectrum Access Research and Development	05	66,125					U
150	0304270A	Electronic Warfare Development	05	18,425	14,616	14,616			U
151	1205117A	Tractor Bears	05		17,928	17,928			U
		System Development & Demonstration		2,502,560	3,012,840	3,012,840	57,840	57,840	
152	0604256A	Threat Simulator Development	06	28,883	22,862	22,862			U
153	0604258A	Target Systems Development	06	18,518	13,902	13,902			U
154	0604759A	Major T&E Investment	06	93,668	102,901	102,901			U
155	0605103A	Rand Arroyo Center	06	19,863	20,140	20,140			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018	FY 2018	FY 2018	FY 2018	FY 2018	S	
				Emergency Requests**	Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	Emergency	Total PB Requests* with CR Adj Base + OCO + Emergency**	Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs		Remaining Req with CR Adj Base + OCO + Emergency
140	0605380A	AMF Joint Tactical Radio System (JTRS)	05				8,965		8,965	U
141	0605450A	Joint Air-to-Ground Missile (JAGM)	05				34,626		34,626	U
142	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05				336,420		336,420	U
143	0605766A	National Capabilities Integration (MIP)	05				6,882		6,882	U
144	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05				23,467		23,467	U
145	0605830A	Aviation Ground Support Equipment	05				6,930		6,930	U
146	0210609A	Paladin Integrated Management (PIM)	05				6,112		6,112	U
147	0303032A	TROJAN - RH12	05				5,631		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				14,616		14,616	U
151	1205117A	Tractor Bears	05				17,928		17,928	U
		System Development & Demonstration					3,070,680		3,070,680	
152	0604256A	Threat Simulator Development	06				22,862		22,862	U
153	0604258A	Target Systems Development	06				13,902		13,902	U
154	0604759A	Major T&E Investment	06				102,901		102,901	U
155	0605103A	Rand Arroyo Center	06				20,140		20,140	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
140	0605380A	AMF Joint Tactical Radio System (JTRS)	05	15,984		15,984	U
141	0605450A	Joint Air-to-Ground Missile (JAGM)	05	11,773		11,773	U
142	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05	277,607		277,607	U
143	0605766A	National Capabilities Integration (MIP)	05	12,340		12,340	U
144	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	2,686		2,686	U
145	0605830A	Aviation Ground Support Equipment	05	2,706		2,706	U
146	0210609A	Paladin Integrated Management (PIM)	05				U
147	0303032A	TROJAN - RH12	05	4,521	1,200	5,721	U
148	0303267A	Auctioned Spectrum Relocation Fund	05				U
149	0303367A	Spectrum Access Research and Development	05				U
150	0304270A	Electronic Warfare Development	05	8,922		8,922	U
151	1205117A	Tractor Bears	05	23,170		23,170	U
		System Development & Demonstration		3,192,689	236,863	3,429,552	
152	0604256A	Threat Simulator Development	06	12,835		12,835	U
153	0604258A	Target Systems Development	06	12,135		12,135	U
154	0604759A	Major T&E Investment	06	82,996		82,996	U
155	0605103A	Rand Arroyo Center	06	19,821		19,821	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-11B

xli

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests* with CR Adj OCO	S e c
156	0605301A	Army Kwajalein Atoll	06	219,271	246,663	246,663			U
157	0605326A	Concepts Experimentation Program	06	24,668	29,820	29,820			U
158	0605502A	Small Business Innovative Research	06	230,691					U
159	0605601A	Army Test Ranges and Facilities	06	305,238	307,588	307,588			U
160	0605602A	Army Technical Test Instrumentation and Targets	06	70,523	49,242	49,242			U
161	0605604A	Survivability/Lethality Analysis	06	38,245	41,843	41,843			U
162	0605606A	Aircraft Certification	06	4,486	4,804	4,804			U
163	0605702A	Meteorological Support to RDT&E Activities	06	6,793	7,238	7,238			U
164	0605706A	Materiel Systems Analysis	06	21,510	21,890	21,890			U
165	0605709A	Exploitation of Foreign Items	06	12,415	12,684	12,684			U
166	0605712A	Support of Operational Testing	06	49,580	51,040	51,040			U
167	0605716A	Army Evaluation Center	06	55,460	56,246	56,246			U
168	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06	7,653	1,829	1,829			U
169	0605801A	Programwide Activities	06	50,971	55,060	55,060			U
170	0605803A	Technical Information Activities	06	29,905	33,934	33,934			U
171	0605805A	Munitions Standardization, Effectiveness and Safety	06	63,983	43,444	43,444			U
172	0605857A	Environmental Quality Technology Mgmt Support	06	2,048	5,087	5,087			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S
156	0605301A	Army Kwajalein Atoll	06				246,663		246,663	U
157	0605326A	Concepts Experimentation Program	06				29,820		29,820	U
158	0605502A	Small Business Innovative Research	06							U
159	0605601A	Army Test Ranges and Facilities	06				307,588		307,588	U
160	0605602A	Army Technical Test Instrumentation and Targets	06				49,242		49,242	U
161	0605604A	Survivability/Lethality Analysis	06				41,843		41,843	U
162	0605606A	Aircraft Certification	06				4,804		4,804	U
163	0605702A	Meteorological Support to RDT&E Activities	06				7,238		7,238	U
164	0605706A	Materiel Systems Analysis	06				21,890		21,890	U
165	0605709A	Exploitation of Foreign Items	06				12,684		12,684	U
166	0605712A	Support of Operational Testing	06				51,040		51,040	U
167	0605716A	Army Evaluation Center	06				56,246		56,246	U
168	0605718A	Army Modeling & Sim X-Command Collaboration & Integ	06				1,829		1,829	U
169	0605801A	Programwide Activities	06				55,060		55,060	U
170	0605803A	Technical Information Activities	06				33,934		33,934	U
171	0605805A	Munitions Standardization, Effectiveness and Safety	06				43,444		43,444	U
172	0605857A	Environmental Quality Technology Mgmt Support	06				5,087		5,087	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

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156	0605301A	Army Kwajalein Atoll	06	246,574		246,574	U
157	0605326A	Concepts Experimentation Program	06	30,430		30,430	U
158	0605502A	Small Business Innovative Research	06				U
159	0605601A	Army Test Ranges and Facilities	06	305,759		305,759	U
160	0605602A	Army Technical Test Instrumentation and Targets	06	62,379		62,379	U
161	0605604A	Survivability/Lethality Analysis	06	40,496		40,496	U
162	0605606A	Aircraft Certification	06	3,941		3,941	U
163	0605702A	Meteorological Support to RDT&E Activities	06	9,767		9,767	U
164	0605706A	Materiel Systems Analysis	06	21,226		21,226	U
165	0605709A	Exploitation of Foreign Items	06	13,026		13,026	U
166	0605712A	Support of Operational Testing	06	52,718		52,718	U
167	0605716A	Army Evaluation Center	06	57,049		57,049	U
168	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06	2,801		2,801	U
169	0605801A	Programwide Activities	06	60,942		60,942	U
170	0605803A	Technical Information Activities	06	29,050		29,050	U
171	0605805A	Munitions Standardization, Effectiveness and Safety	06	42,332		42,332	U
172	0605857A	Environmental Quality Technology Mgmt Support	06	3,216		3,216	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
173	0605898A	Army Direct Report Headquarters - R&D - MHA	06	49,287	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	0606003A	CounterIntel and Human Intel Modernization	06						U
177	0606942A	Assessments and Evaluations Cyber Vulnerabilities	06						U
178	0303260A	Defense Military Deception Initiative	06	1,923	1,779	1,779			U
179	0909980A	Judgment Fund Reimbursement	06	7,893					U
180	0909999A	Financing for Cancelled Account Adjustments	06	6					U
		RDT&E Management Support		1,413,481	1,253,845	1,253,845			
181	0603778A	MLRS Product Improvement Program	07	34,391	8,929	8,929			U
182	0603813A	TRACTOR PULL	07	3,960	4,014	4,014			U
183	0605024A	Anti-Tamper Technology Support	07	3,498	4,094	4,094			U
184	0607131A	Weapons and Munitions Product Improvement Programs	07	19,969	15,738	15,738			U
185	0607133A	TRACTOR SMOKE	07	4,479	4,513	4,513			U
186	0607134A	Long Range Precision Fires (LRPF)	07	36,322	102,014	102,014			U
187	0607135A	Apache Product Improvement Program	07	60,995	59,977	59,977			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S
173	0605898A	Army Direct Report Headquarters - R&D - MHA	06				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	0606003A	CounterIntel and Human Intel Modernization	06							U
177	0606942A	Assessments and Evaluations Cyber Vulnerabilities	06							U
178	0303260A	Defense Military Deception Initiative	06				1,779		1,779	U
179	0909980A	Judgment Fund Reimbursement	06							U
180	0909999A	Financing for Cancelled Account Adjustments	06							U
		RDT&E Management Support					1,253,845		1,253,845	
181	0603778A	MLRS Product Improvement Program	07				8,929		8,929	U
182	0603813A	TRACTOR PULL	07				4,014		4,014	U
183	0605024A	Anti-Tamper Technology Support	07				4,094		4,094	U
184	0607131A	Weapons and Munitions Product Improvement Programs	07				15,738		15,738	U
185	0607133A	TRACTOR SMOKE	07				4,513		4,513	U
186	0607134A	Long Range Precision Fires (LRPF)	07				102,014		102,014	U
187	0607135A	Apache Product Improvement Program	07				59,977		59,977	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
173	0605898A	Army Direct Report Headquarters - R&D - MHA	06	54,145		54,145	U
174	0606001A	Military Ground-Based CREW Technology	06	4,896		4,896	U
175	0606002A	Ronald Reagan Ballistic Missile Defense Test Site	06	63,011		63,011	U
176	0606003A	CounterIntel and Human Intel Modernization	06	2,636		2,636	U
177	0606942A	Assessments and Evaluations Cyber Vulnerabilities	06	88,300		88,300	U
178	0303260A	Defense Military Deception Initiative	06				U
179	0909980A	Judgment Fund Reimbursement	06				U
180	0909999A	Financing for Cancelled Account Adjustments	06				U
		RDT&E Management Support		1,322,481		1,322,481	
181	0603778A	MLRS Product Improvement Program	07	8,886		8,886	U
182	0603813A	TRACTOR PULL	07	4,067		4,067	U
183	0605024A	Anti-Tamper Technology Support	07	4,254		4,254	U
184	0607131A	Weapons and Munitions Product Improvement Programs	07	16,022	2,548	18,570	U
185	0607133A	TRACTOR SMOKE	07	4,577	7,780	12,357	U
186	0607134A	Long Range Precision Fires (LRPF)	07	186,475		186,475	U
187	0607135A	Apache Product Improvement Program	07	31,049		31,049	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-13B

xlvii

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
188	0607136A	Blackhawk Product Improvement Program	07	44,966	34,416	34,416			U
189	0607137A	Chinook Product Improvement Program	07	88,314	194,567	194,567			U
190	0607138A	Fixed Wing Product Improvement Program	07	765	9,981	9,981			U
191	0607139A	Improved Turbine Engine Program	07	111,638	204,304	204,304			U
192	0607140A	Emerging Technologies from NIE	07	2,278	1,023	1,023			U
193	0607141A	Logistics Automation	07	1,542	1,504	1,504			U
194	0607142A	Aviation Rocket System Product Improvement and Development	07		10,064	10,064			U
195	0607143A	Unmanned Aircraft System Universal Products	07		38,463	38,463			U
196	0607665A	Family of Biometrics	07	11,632	6,159	6,159			U
197	0607865A	Patriot Product Improvement	07	48,073	90,217	90,217			U
198	0202429A	Aerostat Joint Project - COCOM Exercise	07	6,178	6,749	6,749			U
199	0203728A	Joint Automated Deep Operation Coordination System (JADOCs)	07	29,412	33,520	33,520			U
200	0203735A	Combat Vehicle Improvement Programs	07	340,353	343,175	343,175			U
201	0203740A	Maneuver Control System	07	3,943	6,639	6,639			U
202	0203743A	155mm Self-Propelled Howitzer Improvements	07		40,784	40,784			U
203	0203744A	Aircraft Modifications/Product Improvement Programs	07	32,397	39,358	39,358			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

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188	0607136A	Blackhawk Product Improvement Program	07				34,416		34,416	U
189	0607137A	Chinook Product Improvement Program	07				194,567		194,567	U
190	0607138A	Fixed Wing Product Improvement Program	07				9,981		9,981	U
191	0607139A	Improved Turbine Engine Program	07				204,304		204,304	U
192	0607140A	Emerging Technologies from NIE	07				1,023		1,023	U
193	0607141A	Logistics Automation	07				1,504		1,504	U
194	0607142A	Aviation Rocket System Product Improvement and Development	07				10,064		10,064	U
195	0607143A	Unmanned Aircraft System Universal Products	07				38,463		38,463	U
196	0607665A	Family of Biometrics	07				6,159		6,159	U
197	0607865A	Patriot Product Improvement	07				90,217		90,217	U
198	0202429A	Aerostat Joint Project - COCOM Exercise	07				6,749		6,749	U
199	0203728A	Joint Automated Deep Operation Coordination System (JADOCs)	07				33,520		33,520	U
200	0203735A	Combat Vehicle Improvement Programs	07				343,175		343,175	U
201	0203740A	Maneuver Control System	07				6,639		6,639	U
202	0203743A	155mm Self-Propelled Howitzer Improvements	07				40,784		40,784	U
203	0203744A	Aircraft Modifications/Product Improvement Programs	07				39,358		39,358	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
188	0607136A	Blackhawk Product Improvement Program	07	35,240		35,240	U
189	0607137A	Chinook Product Improvement Program	07	157,822		157,822	U
190	0607138A	Fixed Wing Product Improvement Program	07	4,189		4,189	U
191	0607139A	Improved Turbine Engine Program	07	192,637		192,637	U
192	0607140A	Emerging Technologies from NIE	07				U
193	0607141A	Logistics Automation	07				U
194	0607142A	Aviation Rocket System Product Improvement and Development	07	60,860		60,860	U
195	0607143A	Unmanned Aircraft System Universal Products	07	52,019		52,019	U
196	0607665A	Family of Biometrics	07	2,400		2,400	U
197	0607865A	Patriot Product Improvement	07	65,369		65,369	U
198	0202429A	Aerostat Joint Project - COCOM Exercise	07	1		1	U
199	0203728A	Joint Automated Deep Operation Coordination System (JADOCs)	07	30,954		30,954	U
200	0203735A	Combat Vehicle Improvement Programs	07	411,927		411,927	U
201	0203740A	Maneuver Control System	07				U
202	0203743A	155mm Self-Propelled Howitzer Improvements	07	40,676		40,676	U
203	0203744A	Aircraft Modifications/Product Improvement Programs	07	17,706		17,706	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-14B

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
204	0203752A	Aircraft Engine Component Improvement Program	07	249	145	145			U
205	0203758A	Digitization	07	6,234	4,803	4,803			U
206	0203801A	Missile/Air Defense Product Improvement Program	07	24,925	2,723	2,723	15,000	15,000	U
207	0203802A	Other Missile Product Improvement Programs	07	8,283	5,000	5,000			U
208	0203808A	TRACTOR CARD	07	20,333	37,883	37,883			U
209	0205402A	Integrated Base Defense - Operational System Dev	07	3,450					U
210	0205410A	Materials Handling Equipment	07	119	1,582	1,582			U
211	0205412A	Environmental Quality Technology - Operational System Dev	07		195	195			U
212	0205456A	Lower Tier Air and Missile Defense (AMD) System	07	61,449	78,926	78,926			U
213	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	21,196	102,807	102,807			U
214	0208053A	Joint Tactical Ground System	07	12,649					U
216	0303028A	Security and Intelligence Activities	07	15,719	13,807	13,807			U
217	0303140A	Information Systems Security Program	07	36,892	132,438	132,438			U
218	0303141A	Global Combat Support System	07	26,176	64,370	64,370			U
219	0303142A	SATCOM Ground Environment (SPACE)	07	18,761					U
220	0303150A	WWMCCS/Global Command and Control System	07	4,536	10,475	10,475			U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

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204	0203752A	Aircraft Engine Component Improvement Program	07				145		145	U
205	0203758A	Digitization	07				4,803		4,803	U
206	0203801A	Missile/Air Defense Product Improvement Program	07				17,723		17,723	U
207	0203802A	Other Missile Product Improvement Programs	07				5,000		5,000	U
208	0203808A	TRACTOR CARD	07				37,883		37,883	U
209	0205402A	Integrated Base Defense - Operational System Dev	07							U
210	0205410A	Materials Handling Equipment	07				1,582		1,582	U
211	0205412A	Environmental Quality Technology - Operational System Dev	07				195		195	U
212	0205456A	Lower Tier Air and Missile Defense (AMD) System	07				78,926		78,926	U
213	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07				102,807		102,807	U
214	0208053A	Joint Tactical Ground System	07							U
216	0303028A	Security and Intelligence Activities	07				13,807		13,807	U
217	0303140A	Information Systems Security Program	07				132,438		132,438	U
218	0303141A	Global Combat Support System	07				64,370		64,370	U
219	0303142A	SATCOM Ground Environment (SPACE)	07							U
220	0303150A	WWMCCS/Global Command and Control System	07				10,475		10,475	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se c
204	0203752A	Aircraft Engine Component Improvement Program	07	146		146	U
205	0203758A	Digitization	07	6,316		6,316	U
206	0203801A	Missile/Air Defense Product Improvement Program	07	1,643	2,000	3,643	U
207	0203802A	Other Missile Product Improvement Programs	07	4,947		4,947	U
208	0203808A	TRACTOR CARD	07	34,050		34,050	U
209	0205402A	Integrated Base Defense - Operational System Dev	07		8,000	8,000	U
210	0205410A	Materials Handling Equipment	07	1,464		1,464	U
211	0205412A	Environmental Quality Technology - Operational System Dev	07	249		249	U
212	0205456A	Lower Tier Air and Missile Defense (AMD) System	07	79,283		79,283	U
213	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	154,102		154,102	U
214	0208053A	Joint Tactical Ground System	07				U
216	0303028A	Security and Intelligence Activities	07	12,280	23,199	35,479	U
217	0303140A	Information Systems Security Program	07	68,533		68,533	U
218	0303141A	Global Combat Support System	07	68,619		68,619	U
219	0303142A	SATCOM Ground Environment (SPACE)	07				U
220	0303150A	WWMCCS/Global Command and Control System	07	2,034		2,034	U

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

UNCLASSIFIED

Page A-15B

iii

UNCLASSIFIED

Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2017 (Base + OCO)	FY 2018 PB Request with CR Adj Base	FY 2018 Total PB Requests* with CR Adj Base	FY 2018 PB Request with CR Adj OCO	FY 2018 Total PB Requests+ with CR Adj OCO	S e c
223	0305172A	Combined Advanced Applications	07		1,100	1,100			U
224	0305179A	Integrated Broadcast Service (IBS)	07						U
225	0305204A	Tactical Unmanned Aerial Vehicles	07	8,218	9,433	9,433	7,492	7,492	U
226	0305206A	Airborne Reconnaissance Systems	07	11,799	5,080	5,080	15,000	15,000	U
227	0305208A	Distributed Common Ground/Surface Systems	07	32,284	24,700	24,700			U
228	0305219A	MQ-1C Gray Eagle UAS	07	13,470	9,574	9,574			U
229	0305232A	RQ-11 UAV	07	1,613	2,191	2,191			U
230	0305233A	RQ-7 UAV	07	4,597	12,773	12,773			U
231	0307665A	Biometrics Enabled Intelligence	07	8,854	2,537	2,537	6,036	6,036	U
232	0310349A	Win-T Increment 2 - Initial Networking	07	4,680	4,723	4,723			U
233	0708045A	End Item Industrial Preparedness Activities	07	59,891	60,877	60,877			U
234	1203142A	SATCOM Ground Environment (SPACE)	07		11,959	11,959			U
235	1208053A	Joint Tactical Ground System	07		10,228	10,228			U
9999	9999999999	Classified Programs		4,625	7,154	7,154			U
		Operational Systems Development		1,296,107	1,877,685	1,877,685	43,528	43,528	
236	0901560A	Continuing Resolution Programs	20		-1,151,993	-1,151,993	222,988	222,988	U
		Undistributed			-1,151,993	-1,151,993	222,988	222,988	
Total Research, Development, Test & Eval, Army				8,852,507	8,273,447	8,273,447	342,356	342,356	

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

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Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2018 Emergency Requests**	FY 2018 Less Enacted Div B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req Emergency	FY 2018 Total PB Requests* with CR Adj Base + OCO + Emergency**	FY 2018 Less Enacted DIV B P.L.115-96*** MDDE + Ship Repairs	FY 2018 Remaining Req with CR Adj Base + OCO + Emergency	S
223	0305172A	Combined Advanced Applications	07				1,100		1,100	U
224	0305179A	Integrated Broadcast Service (IBS)	07							U
225	0305204A	Tactical Unmanned Aerial Vehicles	07				16,925		16,925	U
226	0305206A	Airborne Reconnaissance Systems	07				20,080		20,080	U
227	0305208A	Distributed Common Ground/Surface Systems	07				24,700		24,700	U
228	0305219A	MQ-1C Gray Eagle UAS	07				9,574		9,574	U
229	0305232A	RQ-11 UAV	07				2,191		2,191	U
230	0305233A	RQ-7 UAV	07				12,773		12,773	U
231	0307665A	Biometrics Enabled Intelligence	07				8,573		8,573	U
232	0310349A	Win-T Increment 2 - Initial Networking	07				4,723		4,723	U
233	0708045A	End Item Industrial Preparedness Activities	07				60,877		60,877	U
234	1203142A	SATCOM Ground Environment (SPACE)	07				11,959		11,959	U
235	1208053A	Joint Tactical Ground System	07				10,228		10,228	U
9999	9999999999	Classified Programs					7,154		7,154	U
		Operational Systems Development					1,921,213		1,921,213	
236	0901560A	Continuing Resolution Programs	20				-929,005		-929,005	U
		Undistributed					-929,005		-929,005	
Total Research, Development, Test & Eval, Army				20,700	-20,700		8,636,503	-20,700	8,615,803	

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

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Department of the Army
 FY 2019 President's Budget
 Exhibit R-1 FY 2019 President's Budget
 Total Obligational Authority
 (Dollars in Thousands)

18 Jan 2018

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

Line No	Program Element Number	Item	Act	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Se
223	0305172A	Combined Advanced Applications	07	1,500		1,500	U
224	0305179A	Integrated Broadcast Service (IBS)	07	450		450	U
225	0305204A	Tactical Unmanned Aerial Vehicles	07	6,000		6,000	U
226	0305206A	Airborne Reconnaissance Systems	07	12,416	14,000	26,416	U
227	0305208A	Distributed Common Ground/Surface Systems	07	38,667		38,667	U
228	0305219A	MQ-1C Gray Eagle UAS	07				U
229	0305232A	RQ-11 UAV	07	6,180		6,180	U
230	0305233A	RQ-7 UAV	07	12,863		12,863	U
231	0307665A	Biometrics Enabled Intelligence	07	4,310	2,214	6,524	U
232	0310349A	Win-T Increment 2 - Initial Networking	07				U
233	0708045A	End Item Industrial Preparedness Activities	07	53,958		53,958	U
234	1203142A	SATCOM Ground Environment (SPACE)	07	12,119		12,119	U
235	1208053A	Joint Tactical Ground System	07	7,400		7,400	U
9999	9999999999	Classified Programs		5,955		5,955	U
		Operational Systems Development		1,922,614	59,741	1,982,355	
236	0901560A	Continuing Resolution Programs	20				U
		Undistributed					
Total Research, Development, Test & Eval, Army				10,159,379	325,104	10,484,483	

R-119PB: FY 2019 President's Budget (Published Version), as of January 18, 2018 at 15:06:20

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Army • Budget Estimates FY 2019 • RDT&E Program

Program Element Table of Contents (by Budget Activity then Line Item Number)

Appropriation 2040: Research, Development, Test & Evaluation, Army

Line #	Budget Activity	Program Element Number	Program Element Title	Page
109	05	0604805A	Command, Control, Communications Systems - Eng Dev.....	1
110	05	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev.....	11
111	05	0604808A	Landmine Warfare/Barrier - Eng Dev.....	40
112	05	0604818A	Army Tactical Command & Control Hardware & Software.....	80
113	05	0604820A	Radar Development.....	195
114	05	0604822A	General Fund Enterprise Business System (GFEBs).....	208
115	05	0604823A	Firefinder.....	228
116	05	0604827A	Soldier Systems - Warrior Dem/Val.....	249
117	05	0604852A	Suite of Vehicle Protection Systems - EMD.....	281
118	05	0604854A	Artillery Systems - EMD.....	298
119	05	0605013A	Information Technology Development.....	306
120	05	0605018A	Integrated Personnel and Pay System-Army (IPPS-A).....	368
121	05	0605028A	Armored Multi-Purpose Vehicle (AMPV).....	380
122	05	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C).....	393
123	05	0605030A	Joint Tactical Networking Center.....	402
124	05	0605031A	Joint Tactical Network (JTN).....	412

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Army • Budget Estimates FY 2019 • RDT&E Program

Appropriation 2040: Research, Development, Test & Evaluation, Army

Line #	Budget Activity	Program Element Number	Program Element Title	Page
125	05	0605032A	TRACTOR TIRE.....	434
126	05	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E).....	435
127	05	0605034A	Tactical Security System (TSS).....	443
128	05	0605035A	Common Infrared Countermeasures (CIRCM).....	450
129	05	0605036A	Combating Weapons of Mass Destruction (CWMD).....	460
130	05	0605037A	Evidence Collection and Detainee Processing (ECDP).....	469
131	05	0605038A	NBC Reconnaissance Veh (NBCRV) Sensor Suite.....	474
132	05	0605041A	Defensive CYBER Tool Development.....	482
133	05	0605042A	Tactical Network Radio Systems (Low-Tier).....	495
134	05	0605047A	Army Contract Writing System.....	510
135	05	0605049A	Missile Warning System Modernization (MWSM).....	519
136	05	0605051A	Aircraft Survivability Development.....	526
137	05	0605052A	Indirect Fire Protection Capability Increment 2.....	544
138	05	0605053A	Ground Robotics.....	559
139	05	0605054A	Emerging Technology Initiatives.....	609
140	05	0605380A	AMF Joint Tactical Radio System (JTRS).....	619
141	05	0605450A	Joint Air-to-Ground Missile (JAGM).....	629
142	05	0605457A	Army Integrated Air and Missile Defense (AIAMD).....	638

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Army • Budget Estimates FY 2019 • RDT&E Program

Appropriation 2040: Research, Development, Test & Evaluation, Army

Line #	Budget Activity	Program Element Number	Program Element Title	Page
143	05	0605766A	National Capabilities Integration (MIP).....	649
144	05	0605812A	Joint Light Tactical Vehicle - ED.....	664
145	05	0605830A	Aviation Ground Support Equipment.....	675
146	05	0210609A	Paladin Integrated Management (PIM).....	683
147	05	0303032A	TROJAN - RH12.....	691
148	05	0303267A	Auctioned Spectrum Relocation Fund.....	702
149	05	0303367A	Spectrum Access Research and Development.....	703
150	05	0304270A	Electronic Warfare Development - MIP.....	717
151	05	1205117A	Tractor Bears.....	735

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Army • Budget Estimates FY 2019 • RDT&E Program

Program Element Table of Contents (Alphabetically by Program Element Title)

Program Element Title	Program Element Number	Line #	BA	Page
AMF Joint Tactical Radio System (JTRS)	0605380A	140	05.....	619
Aircraft Survivability Development	0605051A	136	05.....	526
Armored Multi-Purpose Vehicle (AMPV)	0605028A	121	05.....	380
Army Contract Writing System	0605047A	134	05.....	510
Army Integrated Air and Missile Defense (AIAMD)	0605457A	142	05.....	638
Army Tactical Command & Control Hardware & Software	0604818A	112	05.....	80
Artillery Systems - EMD	0604854A	118	05.....	298
Auctioned Spectrum Relocation Fund	0303267A	148	05.....	702
Aviation Ground Support Equipment	0605830A	145	05.....	675
Combating Weapons of Mass Destruction (CWMD)	0605036A	129	05.....	460
Command, Control, Communications Systems - Eng Dev	0604805A	109	05.....	1
Common Infrared Countermeasures (CIRCM)	0605035A	128	05.....	450
Defensive CYBER Tool Development	0605041A	132	05.....	482
Electronic Warfare Development - MIP	0304270A	150	05.....	717
Emerging Technology Initiatives	0605054A	139	05.....	609
Evidence Collection and Detainee Processing (ECDP)	0605037A	130	05.....	469
Firefinder	0604823A	115	05.....	228

UNCLASSIFIED

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Army • Budget Estimates FY 2019 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
General Fund Enterprise Business System (GFEBS)	0604822A	114	05.....	208
Ground Robotics	0605053A	138	05.....	559
Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	0605033A	126	05.....	435
Indirect Fire Protection Capability Increment 2	0605052A	137	05.....	544
Information Technology Development	0605013A	119	05.....	306
Integrated Ground Security Surveillance Response Capability (IGSSR-C)	0605029A	122	05.....	393
Integrated Personnel and Pay System-Army (IPPS-A)	0605018A	120	05.....	368
Joint Air-to-Ground Missile (JAGM)	0605450A	141	05.....	629
Joint Light Tactical Vehicle - ED	0605812A	144	05.....	664
Joint Tactical Network (JTN)	0605031A	124	05.....	412
Joint Tactical Networking Center	0605030A	123	05.....	402
Landmine Warfare/Barrier - Eng Dev	0604808A	111	05.....	40
Medical Materiel/Medical Biological Defense Equipment - Eng Dev	0604807A	110	05.....	11
Missile Warning System Modernization (MWSM)	0605049A	135	05.....	519
NBC Reconnaissance Veh (NBCRV) Sensor Suite	0605038A	131	05.....	474
National Capabilities Integration (MIP)	0605766A	143	05.....	649
Paladin Integrated Management (PIM)	0210609A	146	05.....	683
Radar Development	0604820A	113	05.....	195
Soldier Systems - Warrior Dem/Val	0604827A	116	05.....	249

UNCLASSIFIED

UNCLASSIFIED

Army • Budget Estimates FY 2019 • RDT&E Program

Program Element Title	Program Element Number	Line #	BA	Page
Spectrum Access Research and Development	0303367A	149	05.....	703
Suite of Vehicle Protection Systems - EMD	0604852A	117	05.....	281
TRACTOR TIRE	0605032A	125	05.....	434
TROJAN - RH12	0303032A	147	05.....	691
Tactical Network Radio Systems (Low-Tier)	0605042A	133	05.....	495
Tactical Security System (TSS)	0605034A	127	05.....	443
Tractor Bears	1205117A	151	05.....	735

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FY 2019 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 2019.

2. **Relationship of the FY 2019 Budget Submitted to Congress to the FY 2018 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:

Budget Activity	OSDPE / Project	Project Title
02	0602126A / XW8	TRACTOR JACK
02	0602787A / XV5	Medical Capabilities to Support Dispersed Ops
04	0604020A / CF1	CFT Advanced Development & Prototyping
04	0604113A / EX8	Future Tactical Unmanned Aircraft System (FTUAS)
06	0605898A / FJ2	Army SHARP RDTE
06	0606942A / FL2	Cyber Vulnerabilities Assessments and Evaluations
07	0305179A / EF4	Integrated Broadcast System
07	0305206A / EH7	Guardrail Common Sensor (GRCS) Payloads (MIP)
07	0305206A / EH2	EMARSS ADV DEV (MIP)

B. Program Element/Project Restructures:

Budget Activity	Old OSDPE / Project: Title	New OSDPE / Project: Title
02	0602105A / H84: Materials	0602105A / XW4: Manufacturing Science
02	0602270A / 906: Tactical Electronic Warfare Applied Research	0602270A / CYB: Applied Offensive Cyber
02	0602782A / 779: Command, Control And Platform Electronics Tech	0602782A / CY2: Applied Defensive Cyber
02	0602782A / H92: Communications Technology	0602782A / CY2: Applied Defensive Cyber
02	0602786A / 283: Airdrop Adv Tech	0602786A / XW5: Small Unit Expeditionary Maneuver Technology
02	0602786A / H99: Joint Service Combat Feeding Technology	0602786A / XW5: Small Unit Expeditionary Maneuver Technology
02	0602786A / VT4: Expeditionary Mobile Base Camp Technology	0602786A / XW5: Small Unit Expeditionary Maneuver Technology
03	0603001A / C07: Joint Service Combat Feeding Tech Demo	0603001A / XW6: Small Unit Expeditionary Maneuver
03	0603001A / VT5: Expeditionary Mobile Base Camp Demonstration	0603001A / XW6: Small Unit Expeditionary Maneuver
03	0603001A / 242: Airdrop Equipment	0603001A / XW6: Small Unit Expeditionary Maneuver
03	0603270A / K15: Advanced Comm Ecm Demo	0603270A / CY3: Offensive Cyber Demonstration
03	0603270A / K16: Non-Commo Ecm Tech Dem	0603270A / CY3: Offensive Cyber Demonstration
04	0603639A / EL7: Reduced Range Ammunition	0604802A / EP3: Reduced Range Ammunition - Small Caliber
04	0603639A / EL8: LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER	0607131A / ER6: Direct Fire Technology
04	0603639A / EU1: Enhanced Lethality Cannon Munitions	0604802A / EU7: Enhanced Lethality Cannon Munitions
04	0603639A / EU1: Enhanced Lethality Cannon Munitions	0604802A / EU6: 155mm HE Rocket Assist Project Extended Range
04	0604120A / ED5: Assured Positioning, Navigation and Timing (PNT)	1206120A / FJ8: Assured Positioning, Navigation and Timing (PNT)
04	0604120A / EH8: DISMOUNTED	1206120A / FJ9: Dismounted A-PNT
04	0604120A / EH9: PSEUDOLITES	1206120A / FK1: Pseudolites
04	0604120A / EJ2: MOUNTED	1206120A / FK2: Mounted A-PNT
04	0604120A / EJ3: ANTI-JAM ANTENNA	1206120A / FK3: Anti-Jam Antenna
05	0210609A / ED8: Paladin Integrated Management (PIM)	0203743A / FF9: PIM Improvement Program
05	0604798A / FG7: Emerging Technology Initiatives	0604798A / FI3: Rapid Capability Development and Maturation
05	0604827A / S65: Platoon Power Generator	0604827A / EY3: Soldier Power Generator
05	0605053A / FB4: Common Robotic Systems	0605053A / FG8: Common Robotic Controller
07	0303028A / FG2: Counterintelligence & Human Intel Modernization	0606003A / FI9: Counterl Intel and Human Intel Modernization
07	0205402A / EF2: Integrated Base Defense	0605029A / EQ2: IntegGrdSecSurvRespC(IGSSR-C)
07	0205402A / EF2: Integrated Base Defense	0605033A / EQ3: Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)
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 / EK8: Enroute Mission Command	1203142A / FE4: Enroute Mission Command

C. Program Terminations:

<u>Budget Activity</u>	<u>OSDPE / Project</u>	<u>OSDPE Title / Project Title</u>
01	0601103A / V72	University Research Initiatives / Minerva; project ends
01	0601104A / H50	University and Industry Research Centers / Network Sciences Cta; project ends
01	0601104A / H53	University and Industry Research Centers / Army High Performance Computing Research Center; project ends
01	0601104A / H54	University and Industry Research Centers / Micro-Autonomous Systems Technology (MAST) CTA; project ends
02	0602105A / H7G	Materials Technology / Nanomaterials Applied Research; project ends
02	0602120A / SA2	Sensors and Electronic Survivability / Biotechnology Applied Research; project ends
02	0602705A / H17	Electronics and Electronic Devices / Flexible Display Center; project ends
02	0602720A / 895	Environmental Quality Technology / Pollution Prevention; project ends
03	0603001A / 543	Warfighter Advanced Technology / Ammunition Logistics; project ends
03	0603015A / S28	Next Generation Training & Simulation Systems / Immersive Learning Environments; project ends
03	0603020A / DB1	TRACTOR ROSE / DDB1; project ends
03	0603606A / 683	Landmine Warfare and Barrier Advanced Technology / Area Denial Sensors; project ends
03	0603728A / 025	Environmental Quality Technology Demonstrations / Pollution Prevention Technology; project ends
04	0604115A / EX3	Technology Maturation Initiatives / Ground Vehicle Prototyping; project ends
05	0604290A / DW1	Mid-tier Networking Vehicular Radio (MNVR) / Mid-Tier Wideband Networking Vehicular Radio Mnv; project ends
05	0604321A / B41	All Source Analysis System / CI/HUMINT Software Products (MIP); project ends
05	0604321A / B51	All Source Analysis System / Machine - Foreign Language Translation System; project ends
05	0604818A / 334	Army Tactical Command & Control Hardware & Software / Common Software; project ends
06	0303260A / FA9	Defense Military Deception Initiative / Security Initiatives; project ends
06	0604759A / FA4	Major T&E Investment / Warrior Injury Assessment Manikin (WIAMan); transitions to procurement
07	0202429A / EP8	Aerostat Joint Project - COCOM Exercise / COCOM Exercise; project ends
07	0203740A / 484	Maneuver Control System / Maneuver Control System; project ends
07	0303142A / EA3	SATCOM Ground Environment (SPACE) / Transportable Tactical Cmd Comms (T2C2); transitions to procurement
07	0303150A / EA5	WWMCCS/Global Command and Control System / Strategic and Joint Mission Command; transitions to procurement
07	0305219A / MQ1	MQ-1 Gray Eagle UAV / MQ-1 Gray Eagle - Army UAV (MIP); project ends
07	0607140A / ES7	Emerging Technologies from NIE / Emerging Technologies from NIE; project ends
07	0607141A / DY1	Logistics Automation / Logistics Information Warehouse (LIW); project ends

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604805A / <i>Command, Control, Communications Systems - Eng Dev</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	4.166	9.910	15.970	-	15.970	12.595	0.431	14.221	23.631	0.000	80.924
593: <i>Joint Battle Command - Platform (JBC-P)</i>	-	4.166	9.910	15.970	-	15.970	12.595	0.431	14.221	23.631	0.000	80.924

A. Mission Description and Budget Item Justification

Joint Battle Command - Platform (JBC-P) is the cornerstone of Joint Forces' Command and Control (C2), Situational Awareness (SA), and Communications. JBC-P provides secure Blue Force Tracking (BFT) capability at the Platform and Command Post levels, and continuous near-real-time identification of friendly locations, reported enemy, and hazardous locations populating the tactical Common Operating Picture (COP). JBC-P enables Joint, Net-Centric C2/Battle Command by seamlessly passing/sharing relevant information vertically and horizontally, within all tactical levels of command and control. JBC-P is designed to be used on L-Band Satellite Networks and terrestrial radios.

PdM JBC-P, under PM Mission Command (MC), is collaborating with the Communications-Electronics Research, Development and Engineering Center's (CERDEC) Space and Terrestrial Communications Directorate (S&TCD) on evolving BFT network. Systems engineering studies/planning activities are underway to develop the evolution path of the BFT network. In addition, there are two RDT&E contractual efforts underway for FY 2018 and FY 2019 that will aid in assessing the feasibility of reusing existing BFT-2 transceivers (hardware) and replacing them with advanced, government owned hardware/software. The goal is to have a BFT-3, full and open solicitation to industry, ready for FY 2020.

To better understand how potential changes to the BFT network would affect overall operations, S&TCD is working on developing a model of the current BFT-2 waveform to test in the BFT portion of their Network Test Lab. This Test Lab provides the Government the ability to test proposed fixes, conduct regression testing of future Software and Firmware releases, and replicate any problems the system may experience without impacting the operational network.

FORSCOM users have identified a need for an expeditionary JBC-P capability to better connect the Lower Tactical Internet (LTI) to the BFT network when dismantled. PdM JBC-P has partnered with CERDEC's Command, Power and Integration Directorate to develop the capability.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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 0604805A / <i>Command, Control, Communications Systems - Eng Dev</i>
--	---

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	4.245	9.910	5.618	-	5.618
Current President's Budget	4.166	9.910	15.970	-	15.970
Total Adjustments	-0.079	0.000	10.352	-	10.352
• Congressional General Reductions	-0.001	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.078	-			
• Adjustments to Budget Years	-	-	10.352	-	10.352

Change Summary Explanation

FY 2017 change reflects SBIR/STTR and FFRDC transfer.

FY 2019 change reflects anticipated completion of design efforts.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604805A / Command, Control, Communications Systems - Eng Dev				Project (Number/Name) 593 / Joint Battle Command - Platform (JBC-P)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
593: Joint Battle Command - Platform (JBC-P)	-	4.166	9.910	15.970	-	15.970	12.595	0.431	14.221	23.631	0.000	80.924
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Battle Command - Platform (JBC-P) program is the cornerstone of Joint Forces Command and Control (C2) Situational Awareness (SA) and communications. JBC-P includes a network which enables the movement of data and provides secure Blue Force Tracking (BFT) capability in Platforms and Command Posts, providing soldiers and commanders a map-based Common Operating Picture of the battlefield, as a result, reducing fratricide.

PdM JBC-P, under PM Mission Command (MC), is collaborating with the Communications-Electronics Research, Development and Engineering Center's (CERDEC) Space and Terrestrial Communications Directorate (S&TCD) on evolving BFT network. Systems engineering studies/planning activities are underway to develop the evolution path of the BFT network. In addition, there are two RDT&E contractual efforts underway for FY 2018 and FY 2019 that will aid in assessing the feasibility of reusing existing BFT-2 transceivers (hardware) and replacing it with advanced, government owned hardware/software. The goal is to have a BFT-3, full and open solicitation to industry, ready for FY 2020.

To better understand how potential changes to the BFT network would affect overall operations, funding was increased in both FY17 and FY18 to assist PdM JBC-P to fully model the operational BFT network; S&TCD is working on developing a model of the current BFT-2 waveform to test in the BFT portion of their Network Test Lab. This Test Lab provides the Government the ability to test proposed fixes, conduct regression testing of future Software and Firmware releases, and replicate any problems the system may experience without impacting the operational network.

FORSCOM users have identified a need for an expeditionary JBC-P capability to better connect the Lower Tactical Internet (LTI) to the BFT network when dismantled. PdM JBC-P has partnered with CERDEC's Command, Power and Integration Directorate to developed capability.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Software Development	0.355	0.200	-	-	-
Description: Develop capabilities, product applications, platform interoperability, and system services across the JBC-P family of systems, to include the development of capabilities to meet Key Performance Parameters (KPPs), and other system attributes. Develop Multi-Level Security Domains for Network, Users, and Information.					
FY 2018 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604805A / <i>Command, Control, Communications Systems - Eng Dev</i>	Project (Number/Name) 593 / <i>Joint Battle Command - Platform (JBC-P)</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Full fielding of JBC-P hardware with 1.6.0.6 software will continue. There is no further significant software development required beyond potential software patching to mitigate issues that may occur in the field. JBC-P will move into Post Deployment Software Support (PDSS) in FY19. FY 2018 to FY 2019 Increase/Decrease Statement: Software development not applicable in FY19.					
Title: Software/Systems Engineering Description: Perform Software/Systems Engineering in support of the development of JBC-P capabilities, applications, and services, to include, but not limited to, conducting engineering studies, architecture development (both software and network), system analyses, technical readiness assessments, technical interchange meetings/events, and development of related reports and other deliverables. FY 2018 Plans: Continued system engineering efforts for JBC-P balance of CDD threshold requirements and support of the Battle Command product line. Conduct software systems engineering for the integration of the BFT 2.0 Transceiver Waveform Model, Virtual Satellite Network Control Center (SNCC), Virtual Network Services Gateway (NSG), and continue Modeling and Simulation (M&S) for Systems Engineering, Architecture, and Component Characterization & Validation, Satellite Communications (SATCOM). FY 2019 Base Plans: Continued system engineering efforts for JBC-P balance of CDD threshold requirements and support of the Mission Command product line. Conduct Systems Engineering, open systems architecture design, and Component Characterization & Validation for next generation BFT; to include the integration & interoperability of the BFT 2.0 Transceiver, Satellite Network Control Center (SNCC), Satellite Ground Station (SGS), and Waveform/Network Virtualization for the BFT 2 network. FY 2018 to FY 2019 Increase/Decrease Statement: Increase supports waveform/network virtualization for the BFT 2 network.	2.562	7.810	14.170	-	14.170
Title: Test, Evaluation and Integration Description: Plan and conduct system software acceptance testing from CDD for baseline products, Integration Events (i.e., tests and assessments) in support of the JBC-P Family of Systems, to include Risk Reduction Events, vulnerability testing, and Army Interoperability Certification (AIC) testing. MCE test efforts are exclusively funded through the MCE funding line. .	0.030	0.600	0.500	-	0.500

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604805A / <i>Command, Control, Communications Systems - Eng Dev</i>	Project (Number/Name) 593 / <i>Joint Battle Command - Platform (JBC-P)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p><i>FY 2018 Plans:</i> Will continue to conduct testing on enhancements to the JBC-P system resulting from integration of the BFT 2.0 Transceiver Waveform Model, Virtual Satellite Network Control Center (SNCC), Virtual Network Services Gateway (NSG), and Modeling and Simulation (M&S) for Systems Engineering, Architecture, and Component Characterization & Validation, Satellite Communications (SATCOM).</p> <p><i>FY 2019 Base Plans:</i> Will continue to conduct testing on enhancements to the BFT/JBC-P network, to include third party component (transceiver) characterization, and validation of the next generation BFT. Continue to develop a lab based operational risk reduction of the currently fielded BFT 1 & BFT 2 network, to include the Satellite Network Control Center (SNCC), Satellite Ground Station (SGS), and Waveform Virtualization.</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> No change.</p>					
<p><i>Title:</i> Program Management</p> <p><i>Description:</i> JBC-P Program Management, including technical, logistics, and business staff oversight.</p> <p><i>FY 2018 Plans:</i> Will continue to provide technical, logistics and business oversight for JBC-P FoS software development and system engineering activities. Program Management includes funds execution, contract management, and logistical support the BFT Network Evolving and eXtending Transport (NEXT) integrated planning team (IPT).</p> <p><i>FY 2019 Base Plans:</i> Will continue to provide technical, logistical, and business oversight for JBC-P architecture development and system engineering activities. Program Management includes funds execution, contract management, and logistical support for the BFT-3 (Previously BFT Network Evolving and eXtending Transport (NEXT)) integrated planning team (IPT) & consortium (industry & academia).</p>	1.219	1.300	1.300	-	1.300
Accomplishments/Planned Programs Subtotals	4.166	9.910	15.970	-	15.970

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604805A / <i>Command, Control, Communications Systems - Eng Dev</i>	Project (Number/Name) 593 / <i>Joint Battle Command - Platform (JBC-P)</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• W61990: <i>JOINT BATTLE COMMAND - PLATFORM (JBC-P)</i>	227.573	282.549	405.239	26.146	431.385	269.681	257.952	152.827	150.166	0.000	1,772.133

Remarks

Procurement funding in Fiscal Year 2016 through 2023 (Base funding) is designated for the procurement, fielding, and program management of JBC-P Family of Systems including JBC-P and JBC-P Log.

D. Acquisition Strategy

The JBC-P Capabilities Development Document in lieu of Capabilities Production Document (CDD ILO CPD) was Joint Requirements Oversight Council (JROC) approved March 2013. Completed Initial Operational Test & Evaluation (IOT&E) as part of Network Integration Evaluation (NIE) 13.2 in 3QFY2013. The IOT&E tested the JBC-P system software on existing FBCB2 hardware (non-dismountable vehicle systems) and future production-representative hardware. On completion of Army Interoperability Certification (AIC) and Joint Interoperability Test Certification (JITC), MDA authorized Full Rate Production (FRP) in 1QFY2014. First unit equipped (FUE) was successfully conducted 3QFY2015.

Developmental efforts are being performed through intra-government collaboration. System engineering efforts are being performed by CERDEC's Space and Terrestrial Communications Directorate (S&TCD); Command, Power and Integration (CP&I) & the Intelligence and Information Warfare Directorate (I2WD). Hardware along with fielding, training and field support efforts are obtained through existing competitively awarded contracts.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604805A / Command, Control, Communications Systems - Eng Dev	Project (Number/Name) 593 / Joint Battle Command - Platform (JBC-P)
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
JBC-P Software Development	MIPR	Multiple : Multiple	66.963	0.355	Dec 2016	0.200		-		-		-	Continuing	Continuing	-
JBC-P Software/System Engineering	MIPR	Multiple : Multiple	37.253	2.562	Dec 2016	7.810		14.170		-		14.170	Continuing	Continuing	-
Subtotal			104.216	2.917		8.010		14.170		-		14.170	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support (Gov't-Core)	Sub Allot	PM JBC-P : Aberdeen Proving Ground (APG), MD	5.711	1.219	Oct 2016	1.300		1.300		-		1.300	Continuing	Continuing	-
Subtotal			5.711	1.219		1.300		1.300		-		1.300	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Develop and Conduct Tests and Assessments	MIPR	Multiple : Multiple	26.363	0.030	Feb 2017	0.600		0.500		-		0.500	Continuing	Continuing	-
Subtotal			26.363	0.030		0.600		0.500		-		0.500	Continuing	Continuing	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			136.290	4.166	9.910	15.970	-	15.970	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604805A / <i>Command, Control, Communications Systems - Eng Dev</i>	Project (Number/Name) 593 / <i>Joint Battle Command - Platform (JBC-P)</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SWMCE Development																												
AWA 17.1	▲ 1																											
NIE 17.2			▲ 2																									
Army Expeditionary Warfighter Experiment (AEWE)					▲ 3																							
AWA 18.1						▲ 4																						
CyberBlitz 18							▲ 5																					
NIE 18.2								▲ 6																				
AWA 19.1									▲ 7																			
NIE 19.2										▲ 8																		
AWA 20.1											▲ 9																	
NIE 20.2												▲ 10																
AWA 21.1													▲ 11															
NIE 21.2																▲ 12												

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604805A / <i>Command, Control, Communications Systems - Eng Dev</i>		Project (Number/Name) 593 / <i>Joint Battle Command - Platform (JBC-P)</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
AWA 22.1																					▲ 13							
NIE 22.2																									▲ 14			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604805A / <i>Command, Control, Communications Systems - Eng Dev</i>	Project (Number/Name) 593 / <i>Joint Battle Command - Platform (JBC-P)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SW/MCE Development	1	2010	4	2022
AWA 17.1	1	2017	1	2017
NIE 17.2	4	2017	4	2017
Army Expeditionary Warfighter Experiment (AEWE)	2	2018	2	2018
AWA 18.1	3	2018	3	2018
CyberBlitz 18	4	2018	4	2018
NIE 18.2	4	2018	4	2018
AWA 19.1	3	2019	3	2019
NIE 19.2	4	2019	4	2019
AWA 20.1	3	2020	3	2020
NIE 20.2	4	2020	4	2020
AWA 21.1	3	2021	3	2021
NIE 21.2	4	2021	4	2021
AWA 22.1	3	2022	3	2022
NIE 22.2	4	2022	4	2022

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	36.237	39.238	44.542	-	44.542	48.665	50.022	49.735	57.298	0.000	325.737
812: <i>Mil HIV Vac&Drug Dev</i>	-	0.876	1.183	1.179	-	1.179	1.201	1.230	1.067	6.069	0.000	12.805
832: <i>Field Medical Systems Engineering Development</i>	-	19.733	24.812	28.852	-	28.852	31.484	32.382	31.788	34.048	0.000	203.099
849: <i>Infec Dis Drug/Vacc Ed</i>	-	15.520	13.243	14.511	-	14.511	15.980	16.410	16.880	17.181	0.000	109.725
VS8: <i>MEDEVAC Mission Equipment Package (MEP) - End Dev</i>	-	0.108	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.108

A. Mission Description and Budget Item Justification

This Program Element (PE) funds advanced development of medical materiel within the System Demonstration and Low Rate Initial Production portions of the acquisition life cycle using 6.5 (System Development and Demonstration) funding. It supports products successfully developed in the Systems Integration portion of the Systems Development and Demonstration phases through completion of the Milestone C Decision Review. Commercially-off-the-shelf (COTS) medical products are also tested and evaluated for military use, when available. This PE primarily includes pivotal (conclusive) human clinical trials necessary for licensure by the Food and Drug Administration (FDA).

Projects in this PE include the following:

Project 812 funds military relevant human immunodeficiency virus (HIV) medical countermeasures. These funds provide for engineering and manufacturing development of candidate vaccines and drugs to permit large-scale field testing. Development focused on military unique needs effecting manning, mobilization, and deployment. Products from this project will normally transition to Department of Defense (DoD) Health Programs or Other Procurement, Army (OPA) Funds.

Project 832 funds the engineering and manufacturing development of medical products for enhanced combat casualty care and follow-on care, including rehabilitation. Mature COTS medical products are also evaluated for military use. Consideration will also be given to reduce the medical sustainment footprint through smaller weight and cube volume, or equipment independence from supporting materiel. Products from this project will normally transition to OPA Funds.

Project 849 funds development of candidate medical countermeasures for military relevant infectious diseases. These products fall in four major areas: vaccines, drugs, diagnostic kits/devices, and insect control measures to limit exposure and disease transmission. FDA approval is a mandatory obligation for all military products placed into the hands of medical providers or service members for human use. Products from this project will normally transition to DoD Health Programs or OPA funds.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>
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Project VS8 program receives products that transition from VS7 and funds effort to complete research and development for the medical evacuation (MEDEVAC) Mission Essential Packages (MEPs) to support 256 Medical Evacuation legacy helicopters. The Army's force design increased the number of air frames in the force from 12 to 15 aircraft for 37 MEDEVAC companies to better meet operational needs.

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

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	41.124	39.238	45.503	-	45.503
Current President's Budget	36.237	39.238	44.542	-	44.542
Total Adjustments	-4.887	0.000	-0.961	-	-0.961
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-3.506	-			
• SBIR/STTR Transfer	-1.364	-			
• FFRDC Transfer	-0.017	-	-	-	-
• Other Adjustments 2	-	-	-0.961	-	-0.961

Change Summary Explanation

In FY2017 \$3.506 Million was reprogrammed from 0604807A812 to 0603807A811.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>	Project (Number/Name) 812 / <i>Mil HIV Vac&Drug Dev</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
812: <i>Mil HIV Vac&Drug Dev</i>	-	0.876	1.183	1.179	-	1.179	1.201	1.230	1.067	6.069	0.000	12.805
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds militarily relevant human immunodeficiency virus (HIV) medical countermeasures. These funds provide for engineering and manufacturing development of candidate vaccines and drugs to permit large-scale field testing. Development is focused on militarily unique needs effecting manning, mobilization, and deployment.

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

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

	FY 2017	FY 2018	FY 2019
Title: Military HIV Vaccine and Drug Development	0.876	1.183	1.179
Description: This effort provides funds for engineering and manufacturing development of candidate vaccines and drugs to permit large-scale field testing of vaccines for medical countermeasures to HIV.			
FY 2018 Plans: Continuing support of Regional vaccine Phase III (large safety and efficacy trial) in sub-Saharan Africa. Will support Global vaccine efficacy studies at multiple international Army-funded study sites. Support entails the performance of later stage Phase II (safety and effectiveness) and Phase III (pivotal effectiveness) clinical trials of selected Global HIV vaccine.			
FY 2019 Plans: Will continue support of the Global vaccine effectiveness testing effort. This activity is co-funded by the National Institute of Allergy and Infectious Disease (NIAID) and the Bill and Melinda Gates Foundation. This study is anticipated to take 3.5 years to complete.			
FY 2018 to FY 2019 Increase/Decrease Statement: The slight increase of funding in FY19 is due to inflation factor.			
Accomplishments/Planned Programs Subtotals	0.876	1.183	1.179

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

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / Medical Materiel/Medical Biological Defense Equipment - Eng Dev	Project (Number/Name) 812 / Mil HIV Vac&Drug Dev

D. Acquisition Strategy

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

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / Medical Materiel/Medical Biological Defense Equipment - Eng Dev	Project (Number/Name) 812 / Mil HIV Vac&Drug Dev
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Management Services Cost	Various	Various : Various	2.634	-		0.211		1.179		-		1.179	Continuing	Continuing	-
Subtotal			2.634	-		0.211		1.179		-		1.179	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Cost	Various	Henry M. Jackson Foundation, : Various	33.545	-		0.434		-		-		-	Continuing	Continuing	Continuing
Subtotal			33.545	-		0.434		-		-		-	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Support Cost	Various	Various : Various	2.038	-		0.387		-		-		-	Continuing	Continuing	-
Subtotal			2.038	-		0.387		-		-		-	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development T&E Cost	Various	Henry M. Jackson Foundation, : Various	27.095	0.876		0.151		-		-		-	Continuing	Continuing	Continuing
Subtotal			27.095	0.876		0.151		-		-		-	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army								Date: February 2018			
Appropriation/Budget Activity 2040 / 5			R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>				Project (Number/Name) 812 / <i>Mil HIV Vac&Drug Dev</i>				
	Prior Years	FY 2017	FY 2018		FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	65.312	0.876	1.183		1.179	-	1.179	Continuing	Continuing	N/A	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>		Project (Number/Name) 812 / <i>Mil HIV Vac&Drug Dev</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Protein Production of new B/E Protein																												
Phase I Study (small population of healthy volunteers) B/E Protein																												
Phase II prime/boost regional study to confirm safety and evaluate effectiveness																												
Phase III prime/boost regional vaccine in a large well controlled population																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>	Project (Number/Name) 812 / <i>Mil HIV Vac&Drug Dev</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Protein Production of new B/E Protein	3	2016	2	2019
Phase I Study (small population of healthy volunteers) B/E Protein	2	2017	2	2019
Phase II prime/boost regional study to confirm safety and evaluate effectiveness	2	2018	4	2023
Phase III prime/boost regional vaccine in a large well controlled population	1	2020	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>				Project (Number/Name) 832 / <i>Field Medical Systems Engineering Development</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
832: <i>Field Medical Systems Engineering Development</i>	-	19.733	24.812	28.852	-	28.852	31.484	32.382	31.788	34.048	0.000	203.099
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds the engineering and manufacturing development of medical products for enhanced combat casualty care and follow-on care, including rehabilitation. Specifically funds pivotal (conclusive) human clinical trials or mechanical engineering evaluations for effectiveness of devices or biologics (products derived from living organisms) to fulfill unique military requirements. Consideration is also given to reducing the medical sustainment footprint through smaller weight and cube volume, or equipment independence from supporting materiel. This work is frequently completed through a laboratory/contractor team with the contractor obtaining the U.S. FDA licensure for sale of the product.

Major contractors/intra-governmental agencies include: IGR Enterprises, Inc.; Army Medical Department Board Test Center; Se Qual Technologies, Inc.; Enginivity, Inc.; Ultrasound Diagnostics, Inc.; HemCon Medical Technologies,; Cerdak Ltd; Hemerus Medical, LLC; Fast Track Drugs & Biologics, LLC; Integrated Medical Systems, Inc; the National Institutes of Health National Heart, Lung and Blood Institute (NHLBI), and the U.S. Army Aeromedical Research Laboratory, Walter Reed Army Institute of Research (WRAIR) and Institute of Surgical Research (ISR) for user evaluation. Other military agencies include Program Executive Office (PEO) Soldier, PEO Combat Support/Combat Service Support (CS & CSS), and Naval Undersea Warfare Center.

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

	FY 2017	FY 2018	FY 2019
Title: Field Medical Systems Engineering Development PM Medical Devices	3.029	2.519	2.644
Description: This effort funds the engineering and manufacturing development of medical products for enhanced combat casualty care managed by Program Manager (PM)-Medical Devices.			
FY 2018 Plans: Medical Equipment Sets COTS Modernization of Life Cycle Equipment: Will continue development and testing to ensure the most current and cost effective devices are being utilized. Equipment will be selected for modernization based on its own life cycle plan as part of Sets, Kits and Outfits. Junctional / Noncompressible Hemorrhage Control Agent: Developmental efforts will be completed; available for procurement.			
FY 2019 Plans: Medical Equipment Sets COTS Modernization of Life Cycle Equipment: Will continue development and testing to ensure the most current and cost effective devices are being utilized. Equipment will be selected for modernization based on its own life cycle plan as part of a Sets, Kits and Outfits.			
FY 2018 to FY 2019 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>	Project (Number/Name) 832 / <i>Field Medical Systems Engineering Development</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Overall funding was increased in FY19 due to payback from earlier FY funding adjustments and approved higher priorities for PM Medical Devices.				
<p>Title: Field Medical Systems Engineering Development PM Pharmaceuticals</p> <p>Description: Funding is provided for engineering and manufacturing development of medical products managed by PM Pharmaceuticals for enhanced combat casualty care and follow-on care, including rehabilitation.</p> <p>FY 2018 Plans: Cryopreserved Platelets: Completing the in-life portion of the Phase 2 safety and effectiveness study in patients with complex cardiac bypass and/or who have an abnormally low amount of platelets. Continuing development of clinical testing protocols for of Phase 3 (expanded safety, effectiveness and dosing) pivotal study. Continuing the manufacturing development and validation of Cryopreserved platelet batches.</p> <p>Freeze-Dried Plasma Program: Based on additional guidance from the FDA, a new Phase 1 dose escalation study that began in FY17 will continue in FY18. Continuing the preparation for a Phase 2 prospective clinical study (safety and efficacy study that follows patients over time to measure progress/outcomes).</p> <p>FY 2019 Plans: Cryopreserved Platelets: Will complete the Phase 2 safety and effectiveness study in patients with complex cardiac bypass and prepare for of Phase 3 (expanded safety, effectiveness and dosing) pivotal study. Will continue the manufacturing development and validation of Cryopreserved platelet batches.</p> <p>Freeze-Dried Plasma Program: Will continue the Phase 2 prospective clinical trial (safety and efficacy trial that follows patients over time to measure progress/outcomes).</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Money was shifted from this PM to other PM's to fund higher priority products in the 6.5 PE.</p>		10.052	14.951	14.137
<p>Title: Field Medical Systems Engineering Development PM Medical Support Systems</p> <p>Description: This effort funds the engineering and manufacturing development of medical products managed by PM Medical Support Systems for enhanced combat casualty care and follow-on care, including rehabilitation.</p> <p>FY 2018 Plans: Modernization of medical equipment sets: Evaluate the Field Hospital waste water collection system, vector sampling devices, air sampling products, and other commercial items for medical equipment sets.</p>		6.652	3.456	1.592

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>	Project (Number/Name) 832 / <i>Field Medical Systems Engineering Development</i>

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

	FY 2017	FY 2018	FY 2019
<p>Airworthiness Testing: Continue to conduct airworthiness testing for Medical Equipment Set and Mission Essential Package with products covering air and ground medical evacuation. Per Army Regulation 70-62, Airworthiness Qualification of Aircraft Systems, all "carry-on" equipment, to include medical devices, must have an Airworthiness Release.</p> <p>Medical Evacuation and Treatment Vehicles Medical Equipment Set and Mission Essential Package and CASEVAC: Continue to collaborate with Program Executive Office Ground Combat Systems for the implementation of the MES and MEP in Initial Operational Test and Evaluation of Armored Multipurpose Vehicle (AMPV). Collaborate with PEO Combat Support/Combat Service Support for implementation of the CASEVAC system for the JLTV.</p> <p>Waste Treatment System for the CSH: Complete development and incorporate changes to the waste treatment system based upon testing for re-test.</p> <p>Improved Flying Vector Trap (IFVT): Collaborate with the Armed Forces Pest Management Board for adoption of the IFVT as a Department of Defense standardized product.</p> <p>Soldier Optimization Decision Aids: Transition the Cold Weather Ensemble Decision Aid and the Heat Strain Decision Aid to Program Executive Office Soldier. Develop and conduct Independent Validation and Verification and limited user testing of the Environmental Hazards App and Mobility Decision Aids.</p> <p><i>FY 2019 Plans:</i> Modernization of medical equipment sets: Will evaluate blood transport products and other commercial items for medical equipment sets.</p> <p>Airworthiness Testing: Will continue to conduct airworthiness testing, required by AR 70-62, for Medical Equipment Set and Mission Essential Package with products covering air and ground medical evacuation.</p> <p>Medical Evacuation and Treatment Vehicles Medical Equipment Set and Mission Essential Package: Will continue to collaborate with Program Executive Office Ground Combat Systems (PEO GCS) for the implementation of the Medical Equipment Set and Mission Essential Package and user evaluations of the Armored Multipurpose Vehicle.</p> <p>Waste Treatment System for the CSH: Testing of waste Treatment System for the CSH.</p> <p>Soldier Optimization Decision Aids: Coordinate with PEO Soldier to transition the Environment Health Assessment and Risk Management (EHARM) tool.</p>			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>	Project (Number/Name) 832 / <i>Field Medical Systems Engineering Development</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Remote Triage Sensor System: Testing the Remote Triage Sensor System. FY 2018 to FY 2019 Increase/Decrease Statement: Money was shifted from this PM to other PM's to fund higher priority products in the 6.5 PE .			
Title: Field Medical Systems Engineering Development -PM Neurotrauma & Psychological Health Description: This effort funds systems engineering development of medical products managed by Program Manager Neurotrauma & Psychological Health for enhanced combat casualty care and follow-on care, including rehabilitation. FY 2018 Plans: Laboratory Assay for Traumatic Brain Injury (TBI) (formerly TBI Diagnostic Assay System) Increment II Point of Care Device: Finalizing the Biomarker and Platform technologies and combine the technologies into one system to conduct validation studies. FY 2019 Plans: Laboratory Assay for TBI (formerly TBI Diagnostic Assay System) Increment II Point of Care Device: Will begin required validation studies. FY 2018 to FY 2019 Increase/Decrease Statement: Overall funding to the PE was increased from FY18 to FY19 and funds were programmed to this PM to fund the planned progression of the development of a TBI assay and the FDA requirements for clinical trials for this product.	-	3.886	10.479
Accomplishments/Planned Programs Subtotals	19.733	24.812	28.852

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

N/A

Remarks

D. Acquisition Strategy

Develop in-house or industrial prototypes in government-managed programs to meet military and regulatory requirements for production and fielding.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / Medical Materiel/Medical Biological Defense Equipment - Eng Dev	Project (Number/Name) 832 / Field Medical Systems Engineering Development
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Management Services Cost	Various	Various : Various	32.069	2.521		3.724		3.172		-		3.172	Continuing	Continuing	Continuing
Subtotal			32.069	2.521		3.724		3.172		-		3.172	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Freeze-dried Human Plasma	Various	HemCon Medical Technologies, Inc. : Tigard OR	32.783	-		-		-		-		-	Continuing	Continuing	Continuing
Hypertonic Saline Dextran	Various	National Institutes of Health, National Heart, Lung and Blood Institute (NHLBI) : Various	15.100	-		-		-		-		-	Continuing	Continuing	Continuing
Medical Product Development Cost	Various	Various : Various	6.270	-		2.206		2.565		-		2.565	Continuing	Continuing	Continuing
Extended Life Red Blood Cell Product	Various	Hemerus Medical, LLC, : Various	3.140	-		-		-		-		-	Continuing	Continuing	Continuing
Cryopreserved Platelets	Various	Clinical Research Management, Inc : Hinckley, OH	3.293	0.980		4.417		2.640		-		2.640	Continuing	Continuing	Continuing
Cryopreserved Platelets	Various	Multiple DoD activities and Dartmouth Hitchcock Med Ctr : North Potomac, MD	14.362	-		-		-		-		-	Continuing	Continuing	Continuing
Cryopreserved Platelets	Various	TBD : TBD	1.875	-		-		-		-		-	0.000	1.875	-
Intracellular Hemorrhage Treatment	TBD	TBD : TBD	0.600	-		-		-		-		-	0.000	0.600	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / Medical Materiel/Medical Biological Defense Equipment - Eng Dev	Project (Number/Name) 832 / Field Medical Systems Engineering Development
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
TBI Diagnostic Assay System - Increment II (benchtop/POC/ Bandits)	Various	Banyan BioMarkers, Inc : Alachua, FL	0.373	-		-		-		-		-	0.000	0.373	-
Noninvasive Neurodiagnostics	TBD	TBD : TBD	2.647	-		-		-		-		-	0.000	2.647	-
Impedance Threshold Device for the Treatment of Traumatic Brain Injury	TBD	Advance Circulatory Systems Inc. : Roseville, MN	4.387	-		-		-		-		-	0.000	4.387	-
Pre-Hospital Medical Informatics Transport (Ground Transport Telemedicine)	TBD	TBD : TBD	2.116	4.205		-		-		-		-	0.000	6.321	-
Advanced wound care	Various	TBD : TBD	-	1.230		-		-		-		-	0.000	1.230	-
Junction Noncompressible Hemorrhage	TBD	RevMedX Inc : Wilsonville OR	-	1.805		-		-		-		-	0.000	1.805	-
Laboratory Assay for Traumatic Brain Injury	C/Various	Abbott Laboratories : Chicago, IL	-	-		3.910		10.534		-		10.534	Continuing	Continuing	Continuing
Subtotal			86.946	8.220		10.533		15.739		-		15.739	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Regulatory Support	Various	Clinical Research Management, Inc., : Various	6.523	1.520		0.307		0.332		-		0.332	Continuing	Continuing	Continuing
Medical Product Development Support Cost	Various	Various : Various	10.209	-		1.829		-		-		-	Continuing	Continuing	Continuing
Medical Equipment Sets Development	Various	Various : Various	2.670	-		-		-		-		-	0.000	2.670	-
Subtotal			19.402	1.520		2.136		0.332		-		0.332	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>	Project (Number/Name) 832 / <i>Field Medical Systems Engineering Development</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Cryopreserved Platelets (CPP) Phase 2 efficacy clinical studies	Phase 2				Phase 3																							
Cryopreserved Platelets (CPP) Phase III clinical studies																												
Cryopreserved Platelets (CPP) Milestone C													1 MS-C															
Freeze-dried Plasma (FDP) Phase I safety clinical studies	Phase I																											
FDP Phase 2 efficacy clinical studies	Phase 2																											
FDP MS-C													2															
Laboratory Assay for TBI Increment !! Point of Care Device Clinical Trial																												
Laboratory Assay for TBI Point of Care Device MS C																					3							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>	Project (Number/Name) 832 / <i>Field Medical Systems Engineering Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Cryopreserved Platelets (CPP) Phase 2 efficacy clinical studies	3	2015	4	2018
Cryopreserved Platelets (CPP) Phase III clinical studies	4	2017	3	2021
Cryopreserved Platelets (CPP) Milestone C	2	2020	2	2020
Freeze-dried Plasma (FDP) Phase I safety clinical studies	3	2014	2	2018
FDP Phase 2 efficacy clinical studies	2	2016	2	2019
FDP MS-C	4	2020	4	2020
Laboratory Assay for TBI Increment !! Point of Care Device Clinical Trial	1	2020	4	2021
Laboratory Assay for TBI Point of Care Device MS C	1	2023	1	2023

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>	Project (Number/Name) 849 / <i>Infec Dis Drug/Vacc Ed</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
849: <i>Infec Dis Drug/Vacc Ed</i>	-	15.520	13.243	14.511	-	14.511	15.980	16.410	16.880	17.181	0.000	109.725
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project funds development of candidate medical countermeasures (MCM: e.g. vaccines, drugs, diagnostic kits/devices) for militarily relevant infectious diseases. This also funds methods to determine if insects are infected with pathogenic organisms thereby posing a risk to service members' and control insect exposure/prevent Warfighters from being bitten by those insects. It funds research that supports conclusive human clinical trials to demonstrate MCM effectiveness safety and related manufacturing tests. This work, which is jointly performed by military laboratories, civilian contracted pharmaceutical firms and foreign research partners, is directed toward the prevention of disease, early diagnosis, and speeding recovery once diagnosed. Medical products approved for human use must meet the U.S. FDA approval before MCM can be used on Warfighters. Development priority is based upon four major factors: (1) the extent of the disease within the Combatant Commands' theater of operations, (2) the clinical severity of the disease, (3) the technical maturity of the proposed solution, and (4) the affordability of the solution (development, production, and sustainment). Malaria, dysentery, hepatitis, and Dengue diseases (a severe debilitating disease transmitted by mosquitoes), which are found in all Combatant Command areas and are at the top of the infectious diseases risks list.

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

	FY 2017	FY 2018	FY 2019
Title: Infectious Disease Drug and Vaccine Engineering Development	15.520	13.243	14.511
Description: Funding for research and development efforts for Drugs and Vaccines.			
FY 2018 Plans: Dengue Tetravalent Vaccine (DTV): Fund Block I Dengue Tetravalent Vaccine through FY18 to complete two-year study subject follow-up required by Thai Ministry of Public Health. Continue military-specific clinical trials that begin in FY17. Next Generation Malaria Prophylaxis: Continue to complete New Drug Application preparatory work for filing with the FDA. Continue the retinal (eye) safety study started in FY16 and prepare the protocols for required soldier specific studies. Topical Antileishmanial Cream (TLC, Paromomycin/Gentamicin): Conduct stability testing of the registration lots of the drug product. Prepare for potential FDA requirements for post-marketing surveillance or clinical trials to gather additional information about a product's safety, effectiveness, or optimal use. Antimalarial Drug, Artesunate Intravenous: Support the FDA's inquiries during the review process of the New Drug Application. Work with the commercial partner to support commercial marketing and distribution plans for the drug.			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>	Project (Number/Name) 849 / <i>Infec Dis Drug/Vacc Ed</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>Dengue Vaccine Block II: Continue development of additional dengue human challenge strains. Evaluate vaccine candidates using dengue human challenge studies in preparation for pivotal safety, effectiveness, and dosing (Phase III) clinical trials.</p> <p>Rapid Diagnostic and Detection Devices (Infectious Disease Diagnostics (Multiple)): Continue field testing and evaluation of several product candidates to include: dengue and chikungunya.</p> <p>FY 2019 Plans: Dengue Tetravalent Vaccine (DTV): Continue to fund Advance Development (AD) candidate vaccine as it enters third year of pivotal phase 3 clinical trial.</p> <p>Next Generation Malaria Prophylaxis: Will continue the retinal (eye) safety study (3 year study) started in FY17. Address any FDA post-marketing approval requirements.</p> <p>Topical Antileishmanial Cream (TLC, Paromomycin/Gentamicin): The planned submission of the Non-Disclosure Agreement (NDA) did not occur in FY17 due to additional testing requirements by the FDA to demonstrate therapeutic equivalence of pre- and post-manufacturing change drug product. The NDA package will be completed and submitted to the FDA for approval in FY19. The manufacturing process will be validated in preparation for commercial production of the drug product.</p> <p>Antimalarial Drug, Artesunate Intravenous: Will support the FDA's inquiries during the review process of the New Drug Application. Will complete required non-clinical study for FDA review.</p> <p>Dengue Vaccine Block II: Will continue the development, testing and selection of strains for the dengue human infection model (DHIM) to be used in the early evaluation of dengue vaccine candidates in advance of phase 2 and 3 trials.</p> <p>Rapid Diagnostic and Detection Devices (Infectious Disease Diagnostics (Multiple)): The dengue and chikungunya assays will continue to be developed and evaluated. Clinical testing will be conducted for dengue and clinical sites identified for chikungunya.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: The increase of funding in FY19 is due to the planned progression of multiple infectious disease medical products in development. Funding will support the FDA requirements for clinical trials for those products.</p>				
Accomplishments/Planned Programs Subtotals		15.520	13.243	14.511
C. Other Program Funding Summary (\$ in Millions) N/A				

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / Medical Materiel/Medical Biological Defense Equipment - Eng Dev	Project (Number/Name) 849 / Infec Dis Drug/Vacc Ed

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

Remarks

D. Acquisition Strategy

Test and evaluate in-house and commercially developed products in government-managed trials to meet FDA requirements and Environmental Protection Agency registration.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604807A / Medical Materiel/Medical Biological Defense Equipment - Eng Dev				849 / Infec Dis Drug/Vacc Ed							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Medical Product Development Management Services Cost	Various	Various : Various	19.873	0.989		0.877		0.927		-		0.927	Continuing	Continuing	Continuing
Medical Product Development Management Services Cost	C/CPFF	General Dynamics Information Technology : Frederick MD	3.768	3.012		3.212		2.849		-		2.849	0.000	12.841	-
Subtotal			23.641	4.001		4.089		3.776		-		3.776	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Medical Product Development Cost	Various	Various : Various	36.051	1.504		0.963		1.744		-		1.744	Continuing	Continuing	Continuing
Topical Antileishmanial Drug	TBD	TBD : TBD	2.400	-		-		-		-		-	0.000	2.400	-
Topical Antileishmanial Drug	C/TBD	Advantar Laboratories, INC : TBD	1.891	0.316		0.586		-		-		-	0.000	2.793	-
Dengue Tetravalent Vaccine	TBD	TBD : TBD	2.047	-		-		-		-		-	0.000	2.047	-
Hemorrhagic Fever W/ Renal Syndrome	C/TBD	TBD : TBD	1.000	-		-		-		-		-	0.000	1.000	-
Subtotal			43.389	1.820		1.549		1.744		-		1.744	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Medical Product Development Support Cost	Various	Various : Various	19.380	-		-		0.157		-		0.157	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / Medical Materiel/Medical Biological Defense Equipment - Eng Dev	Project (Number/Name) 849 / Infec Dis Drug/Vacc Ed
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Support Cost	PO	Clinical Research Management, In : Hinckley, OH	3.455	1.952		0.976		-		-		-	0.000	6.383	-
Subtotal			22.835	1.952		0.976		0.157		-		0.157	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development T&E Cost	Various	Various : Various	41.721	4.639		4.067		0.895		-		0.895	Continuing	Continuing	Continuing
Dengue Tetravalent Vaccine	TBD	WRAIR/AFRIMS : Silver Spring MD	-	0.952		0.450		0.594		-		0.594	0.000	1.996	-
Dengue Tetravalent Vaccine	C/TBD	TBD : TBD	-	2.156		2.112		1.151		-		1.151	0.000	5.419	-
Product Development of Dengue Tetravalent Vaccine	Various	TBD : TBD	4.530	-		-		-		-		-	0.000	4.530	-
Next Generation Malaria Prophylaxis	C/Various	TBD : TBD	-	-		-		3.561		-		3.561	0.000	3.561	-
Dengue Vaccine block II	C/Various	TBD : TBD	-	-		-		2.633		-		2.633	0.000	2.633	-
Subtotal			46.251	7.747		6.629		8.834		-		8.834	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	136.116	15.520	13.243	14.511	-	14.511	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>	Project (Number/Name) 849 / <i>Infec Dis Drug/Vacc Ed</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023								
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4					
Dengue Tetravalent Vaccine (DTV) Phase 3 Pivotal Clinical Trials	[Redacted]																																
DTV Milestone C (MS-C) Engineering, Manufacturing and Development phase review	[Redacted]																																
DTV Biologic Licensing Application (BLA) Submission	[Redacted]																																
DTV BLA Approval	[Redacted]																																
Malaria Prophylaxis (MS-C) Engineering, Manufacturing and Development phase																																	
Paromomycin/Gentamicin TLC Phase 3 Safety and Effectiveness Clinical Trial																																	
Paromomycin/Gentamicin TLC (MS-C) Engineering, Manufacturing and Development																																	
Paromomycin/Gentamicin TLC New Drug Application (NDA)																																	
Paromomycin/Gentamicin TLC FDA Approval																																	
Paromomycin/Gentamicin TLC (Fielding / Delivery)																																	
Leishmania Rapid Diagnostic Device (Fielding / Delivery)																																	
Dengue Vaccine Block II Adult Indication Studies																																	
Dengue Vaccine Block II OCONUS Clinical Trials																																	

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>	Project (Number/Name) 849 / <i>Infec Dis Drug/Vacc Ed</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Topical Antileishmanial Cream (Paromomycin/Gentamicin, TLC) MS-C									■																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>	Project (Number/Name) 849 / <i>Infec Dis Drug/Vacc Ed</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Dengue Tetravalent Vaccine (DTV) Phase 3 Pivotal Clinical Trials	1	2011	2	2019
DTV Milestone C (MS-C) Engineering, Manufacturing and Development phase review	1	2021	1	2021
DTV Biologic Licensing Application (BLA) Submission	2	2020	2	2020
DTV BLA Approval	2	2021	2	2021
Malaria Prophylaxis (MS-C) Engineering, Manufacturing and Development phase	4	2017	4	2017
Paromomycin/Gentamicin TLC Phase 3 Safety and Effectiveness Clinical Trial	1	2016	1	2017
Paromomycin/Gentamicin TLC (MS-C) Engineering, Manufacturing and Development	2	2018	2	2018
Paromomycin/Gentamicin TLC New Drug Application (NDA)	3	2017	3	2017
Paromomycin/Gentamicin TLC FDA Approval	4	2018	4	2018
Paromomycin/Gentamicin TLC (Fielding / Delivery)	4	2018	4	2020
Leishmania Rapid Diagnostic Device (Fielding / Delivery)	1	2015	4	2020
Dengue Vaccine Block II Adult Indication Studies	1	2016	4	2020
Dengue Vaccine Block II OCONUS Clinical Trials	1	2016	4	2020
Topical Antileishmanial Cream (Paromomycin/Gentamicin, TLC) MS-C	2	2019	2	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>				Project (Number/Name) VS8 / <i>MEDEVAC Mission Equipment Package (MEP) - End Dev</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
VS8: <i>MEDEVAC Mission Equipment Package (MEP) - End Dev</i>	-	0.108	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.108
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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

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

	FY 2017	FY 2018	FY 2019
Title: Interim MEDEVAC Mission Support System (IMMSS)	0.108	-	-
Description: Interim MEDEVAC Mission Support System (IMMSS) - Patient Handling System for safely handling patient through a system of seats, patient litters etc.			
Accomplishments/Planned Programs Subtotals	0.108	-	-

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

N/A

Remarks

D. Acquisition Strategy

Develop in-house or industrial prototypes in government-managed programs to meet military MEDEVAC and regulatory requirements for production and fielding.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / Medical Materiel/Medical Biological Defense Equipment - Eng Dev	Project (Number/Name) VS8 / MEDEVAC Mission Equipment Package (MEP) - End Dev
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
MEDEVAC Mission Sensor Forward Looking Infrared	TBD	Redstone Arsenal, : AL	2.104	-		-		-		-		-	0.000	2.104	-
Subtotal			2.104	-		-		-		-		-	0.000	2.104	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Medical Product Development Support Cost	SS/UCA	Redstone Arsenal : AL	0.621	-		-		-		-		-	0.000	0.621	-
Subtotal			0.621	-		-		-		-		-	0.000	0.621	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
IMMSS test and evaluation	TBD	Redstone Arsenal : AL	-	0.108		-		-		-		-	0.000	0.108	-
Subtotal			-	0.108		-		-		-		-	0.000	0.108	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		2.725	0.108	0.000	-	-	0.000	2.833	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>	Project (Number/Name) VS8 / <i>MEDEVAC Mission Equipment Package (MEP) - End Dev</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
IMMSS (Interim MEDEVAC Mission Support System)	[Redacted]				[Redacted]																							
	Modifications to IMMSS				due to new skills																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604807A / <i>Medical Materiel/Medical Biological Defense Equipment - Eng Dev</i>	Project (Number/Name) VS8 / <i>MEDEVAC Mission Equipment Package (MEP) - End Dev</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
IMMSS (Interim MEDEVAC Mission Support System)	1	2016	4	2017

Note
Modifications to IMMSS based on new approved paramedic skills for medical personnel

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	32.069	34.684	50.817	-	50.817	49.099	53.085	47.084	45.701	0.000	312.539
016: <i>Close Combat Capabilities ENG DEV</i>	-	0.322	10.736	11.872	-	11.872	14.828	11.860	1.976	1.383	0.000	52.977
415: <i>Mine Neutral/Detection</i>	-	31.747	19.848	38.945	-	38.945	34.271	41.225	45.108	44.318	0.000	255.462
434: <i>Anti-Personnel Landmine Alternatives (NSD)</i>	-	0.000	4.100	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.100

A. Mission Description and Budget Item Justification

This program element (PE) provides for the Engineering and Manufacturing Development (EMD) and demonstration of networked munitions, counter mine systems, and counter improvised explosive device capabilities. This PE also implements the National Landmine Policy to develop alternatives to the non-self-destructing counter mobility anti-personnel landmine systems. The PE contributes to area access and area denial (A2/AD) to support unified land operations and improve soldier survivability.

Project 016, Close Combat Capabilities provides for developing improvements to legacy dismounted lane breaching, specifically the Anti-Personnel Obstacle Breaching System (APOBS), and in so doing, provides a pathway to the next generation of dismounted lane breaching systems such as the Rapid Assault Lane Line Charge (RALLC) and the Dismounted Explosive Breaching System (DEBS). The efforts will address capability gaps identified during combat operations and will focus on weight reduction, improved scalability, collateral damage reduction, metallic content elimination, deployment accuracy improvement, and increased effectiveness against the current threat.

In FY 2018 this project includes Next Generation Advanced Bomb Suit (NGABS). This effort will increase the Warfighter lethality and mobility, by optimizing Soldier protection for Explosive Ordnance Disposal (EOD) personnel while effectively managing all life cycle aspects of Personal Protective Equipment (PPE).

Project 415, Mine Neutralization/Detection provides for development of next generation standoff, detection, and neutralization capability programs such as Husky Mounted Detection System (HMDS), Route Clearance & Interrogation System (RCIS), Vehicle Optics Sensor System (VOSS), Standoff Robotic Explosive Hazard Detection System (SREHD), formerly known as the Autonomous Mine Detection System (AMDS), Route Clearance Vehicles (RCV) and Enablers, Multi-Function Video Display (MVD) and Add on Armor (AoA) kits. It also supports development of Explosive Hazard Pre-Detonation (EHP) capability to neutralize/detonate a broad spectrum of improvised explosive hazards while on the move to support area access route clearance missions. Provides funding to the Tank Automotive Research Development Engineering Center (TARDEC) Software Engineering Center (SEC) to integrate enhancements and test Explosive Hazard Pre-Detonation (EHP) software releases incorporating support for MVD.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>
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For RCIS Type I, FY 2019 funding supports the continued incremental funding of two symbiotic EMD contracts that will digitize and automate the High Mobility Engineering Excavator (HMEE). EMD contract efforts include system design, integration, technical/test reviews, logistics development, testing and delivery of RCIS prototypes.

Project 434, Spider Increment 1A will build upon the existing M7 Spider system. The M7 Spider system is a hand-emplaced, remotely controlled (Man-In-The-Loop) system that provides highly responsive terrain-shaping and protection capabilities. M7 Spider replaces persistent anti-personnel landmines, is compliant with US National Landmine policy, and has been fielded to US forces in support of Operation Enduring Freedom and currently being fielded to Engineers and Brigade Combat Teams in the Active and Army National Guard components. Additional capabilities will be developed to enhance the Spider Remote Control Station and demonstrate the ability to employ legacy Government-Off-The-Shelf (GOTS) lethal and non-lethal anti-personnel (AP) munitions and counter mobility obstacles. Spider Increment 1A will utilize an open system architecture to facilitate future munition integration.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	39.630	34.684	39.117	-	39.117
Current President's Budget	32.069	34.684	50.817	-	50.817
Total Adjustments	-7.561	0.000	11.700	-	11.700
• Congressional General Reductions	-0.017	-			
• Congressional Directed Reductions	-6.276	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.268	-			
• Adjustments to Budget Years	-	-	11.700	-	11.700

Change Summary Explanation

FY 2019 increase of \$11.700 million is attributed to Project 016, Close Combat Capabilities and the addition of the new Next Generation Advanced Bomb Suit development, and Project 415, Mine Neutral/Detection for an engineering change to HMDS Ground Penetrating Radar to add wire detection and infrared illumination.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev				Project (Number/Name) 016 / Close Combat Capabilities ENG DEV			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
016: Close Combat Capabilities ENG DEV	-	0.322	10.736	11.872	-	11.872	14.828	11.860	1.976	1.383	0.000	52.977
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This funding supports the materiel / technology development decision and the engineering and manufacturing development / full rate production decision reviews of Soldier Protection Equipment. Specifically, this funding supports the Next Generation Advanced Bomb Suit (NGABS). It leverages advancements in technology to continue improvements to hard and soft body armor components, helmets and other personal protective equipment for Explosive Ordnance Disposal (EOD) personnel.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: Dismounted Lane Breaching System</p> <p>Description: Develops materiel solutions that address operational issues with APOBS related to its weight, lack of scalability, collateral damage, residual metallic debris, deployment accuracy, and effectiveness.</p> <p>FY 2018 Plans: Finalize design; Award contract for qualification hardware; Build qualification hardware; Finalize test plans; Begin preparation for qualification testing.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY 18 will finalize design, test plans and award contract for qualification hardware. FY19 and beyond will have \$0.</p>	0.322	2.000	-	-	-
<p>Title: Next Generation Advanced Bomb Suit (NGABS)</p> <p>Description: Funding line is new to PM Solider Protection and Individual Equipment (SPIE) in FY18. The objective of this effort is to increase the Warfighter lethality, modularity, and mobility, by optimizing Soldier protection for Explosive Ordnance Disposal (EOD) personnel.</p> <p>FY 2018 Plans: The Material Development Decision (MDD) and Milestone B (MS B) has been moved from 4th QTR FY18 into FY19 due to the state of technology maturation.</p> <p>FY 2019 Base Plans:</p>	-	8.736	11.872	-	11.872

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 016 / Close Combat Capabilities ENG DEV

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Obtain a Material Development Decision (MDD) and Milestone B (MS B) decision in FY18 in order to enter into the Engineering and Manufacturing Development phase of the Next Generation Advanced Bomb Suit (NGABS) with the objective of developing for the EOD Soldiers a full body protective ensemble that integrates the latest technological advances in ergonomic design and material science to improve survivability from fragmentation, blast, impact, thermal hazards, and small arms fire based primarily on the design concepts of the Soldier Protection System. The mission of this program is to enhance the tactical utility and applicability of this bomb suit concept by incorporating modularity/scalability and sensor technologies which was not the case in legacy designs. Award a competitive contract for the development of an integrated Suit & Helmet (S&H) and Sensors and Display (S&D) 4th QTR FY19.					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding increase in Next Generation Advanced Bomb Suit portfolio is due to upcoming Milestone B / MDD approval and forecast and testing requirements.					
Accomplishments/Planned Programs Subtotals	0.322	10.736	11.872	-	11.872

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• 121017: NGABS OMA	-	-	0.000	-	0.000	7.700	7.700	13.100	12.700	0.000	41.200

Remarks

D. Acquisition Strategy

The DLBS acquisition strategy is for developing product improvements such as making the system lighter and more module to the Antipersonnel and Obstacle Breaching System. These improvements will then be incorporated into the technical data package for future procurements.

The Next Generation Advanced Bomb Suit (NGABS) Program is a single-step to full capability acquisition program utilizing full and open competition to ensure best value to the Army. Acquisition strategy for this program is a traditional development program that include an Engineering and Manufacturing Development phase ranging in duration from 12 to 48 months due to the level of design complexity and testing required. MS B / MDD is now scheduled for FY18 and MS C for FY22.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 016 / Close Combat Capabilities ENG DEV
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Dismounted Lane Breaching System - Program Management	MIPR	PM CCS : Picatinny Arsenal, NJ	0.100	-		0.100		-		-		-	0.000	0.200	-
NGABS	Allot	PM SPE : Fort Belvoir	-	-		0.736		0.850		-		0.850	0.000	1.586	-
Subtotal			0.100	-		0.836		0.850		-		0.850	0.000	1.786	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Dismounted Lane Breaching System - Preliminary Design Efforts	MIPR	ARDEC : Picatinny Arsenal, NJ	0.185	-		-		-		-		-	0.000	0.185	Continuing
Dismounted Lane Breaching System - Type Classification Activities	MIPR	ARDEC : Picatinny Arsenal, NJ	-	-		0.687		-		-		-	0.000	0.687	-
Dismounted Lane Breaching System - Rocket Design	MIPR	NSWC : Indian Head, MD	0.315	-		-		-		-		-	0.000	0.315	-
Dismounted Lane Breaching System - Type Classification Activities	MIPR	NSWC : Indian Head, MD	-	-		0.168		-		-		-	0.000	0.168	-
NGABS - Product Development	C/FFP	TBD : Various	-	-		5.000		8.022		-		8.022	0.000	13.022	-
Subtotal			0.500	-		5.855		8.022		-		8.022	0.000	14.377	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 016 / Close Combat Capabilities ENG DEV
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Dismounted Lane Breaching System - Trade Studies, SOW and Test Plan Prep	MIPR	ARDEC : Picatinny Arsenal, NJ	0.859	-		-		-		-		-	Continuing	Continuing	Continuing
Dismounted Lane Breaching System - Configuration Management	MIPR	NSWC : Dahlgren, VA	0.106	-		0.045		-		-		-	0.000	0.151	-
NGABS Support Costs	MIPR	TBD : Various	-	-		1.000		1.000		-		1.000	0.000	2.000	-
Subtotal			0.965	-		1.045		1.000		-		1.000	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Dismounted Lane Breaching System - Qualification Test	MIPR	Yuma Proving Ground : Yuma, AZ	-	0.322	Jun 2017	1.000		-		-		-	0.000	1.322	-
NGABS Test & Evaluation	MIPR	TBD : Various	-	-		2.000		2.000		-		2.000	0.000	4.000	-
Subtotal			-	0.322		3.000		2.000		-		2.000	0.000	5.322	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.565	0.322	10.736	11.872	-	11.872	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 016 / Close Combat Capabilities ENG DEV

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Dismounted Lane Breaching System																												
Develop Preliminary Design	[Bar]																											
Preliminary Design Review					▲ 1 PDR																							
Detailed Design Effort					[Bar]																							
User Assessment									▲ 3 User Assessment																			
Critical Design Review (CDR)									▲ 5 CDR																			
Qualification Hardware Build									[Bar]																			
Test Readiness Review													▲ 6 Test Readiness Review															
Qualification Testing													[Bar]															
MS C or ECP																	▲ 7 MS C or ECP											
NGABS EFFORT																												
NGABS MDD					▲ 2																							
NGABS MS B									▲ 4																			

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>		Project (Number/Name) 016 / <i>Close Combat Capabilities ENG DEV</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
NGABS Developmental Testing																												
NGABS MS C									8																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>	Project (Number/Name) 016 / <i>Close Combat Capabilities ENG DEV</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Dismounted Lane Breaching System	1	2016	1	2020
Develop Preliminary Design	4	2016	4	2017
Preliminary Design Review	1	2018	1	2018
Detailed Design Effort	1	2018	4	2018
User Assessment	3	2018	3	2018
Critical Design Review (CDR)	4	2018	4	2018
Qualification Hardware Build	4	2018	1	2019
Test Readiness Review	1	2019	1	2019
Qualification Testing	1	2019	2	2019
MS C or ECP	3	2019	3	2019
NGABS EFFORT	1	2017	4	2024
NGABS MDD	2	2018	2	2018
NGABS MS B	3	2018	3	2018
NGABS Developmental Testing	1	2019	4	2021
NGABS MS C	1	2022	1	2022

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 415 / Mine Neutral/Detection
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
415: Mine Neutral/Detection	-	31.747	19.848	38.945	-	38.945	34.271	41.225	45.108	44.318	0.000	255.462
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project provides for Engineering Manufacturing and Development (EMD) for the next generation of capabilities to detect, identify and neutralize hybrid threats and explosive hazards such as Improvised Explosive Devices (IEDs) and landmines. These capabilities are a Family of Systems (FOS) encompassing handheld, vehicle mounted, small robotic mounted, aerial platform mounted and area access, and neutralization systems operating in manned, remotely controlled, semi-autonomous or fully autonomous modes. Continued development of this FOS is necessary to support Route Clearance Platoons located within both Engineer Companies and Brigade Engineering Battalion Brigade Combat Teams.

The Husky Mounted Detection System (HMDS) is a counter-explosive device capability that provides standoff detection and marking of metallic encased caches and metallic and low-metallic antitank landmines, unexploded ordnance, trigger mechanisms, and improvised explosive devices (IEDs) in support of route and area-clearance operations. HMDS is a mission equipment package mounted on the Husky route clearance vehicle. The program was restructured in Sep 2016 to align with emerging shallow buried Wire Detection (WD) capabilities integrated onto the HMDS Increment A1 configuration (includes Ground Penetrating Radar (GPR)). These changes are necessary to adapt to changing IED threats. WD Technology will be fully integrated through Engineering Change Proposals (ECPs) beginning in FY18. Prototypes developed under the concluded HMDS Increment A2 effort may be leveraged in development of future capabilities. Future capabilities may include detection of deep buried IEDs and caches, and semi-autonomous control of the Husky vehicle and HMDS from inside a follow-on vehicle.

Route Clearance & Interrogation System (RCIS) consists of two semi-autonomous vehicles, RCIS Type I and RCIS Type II, and includes designated control vehicles and Operator Control Units (OCUs) which provide a standoff capability to detect and neutralize the full spectrum of explosive hazards. RCIS Type I and Type II are being procured as separate increments. Type I integrates a semi-autonomous kit onto a High Mobility Engineering Excavator (HMEE) for remote control from a Buffalo Mine Protected Clearance Vehicle (MPCV). RCIS Type I semi-autonomous kit will be integrated onto the HMEE and be capable of interrogating and classifying explosive hazards. Type II integrates a semi-autonomous kit on a route clearance lead Medium Mine Protected Vehicle (MMPV) for operation from another MMPV. The RCIS Type II semi-autonomous kit will be able to detect, neutralize and proof explosive hazards. An OCU will be integrated into a Buffalo MPCV for Type I and an MMPV for Type II. RCIS capabilities will be fielded to Route Clearance Squads and Engineer Platoons.

For RCIS Type I, FY 2019 funding supports the continued incremental funding of two symbiotic EMD contracts that will digitize and automate HMEE. EMD contract efforts include system design, integration, technical/test reviews, logistics development, testing and delivery of RCIS prototypes.

The Vehicle Optics Sensor System (VOSS) provides a telescoping, gyro-stabilized, high-resolution, triple sensor (daylight, night-vision, and thermal-imaging) surveillance system to optically detect from standoff distances, explosive hazards (IEDs and landmines) and their trigger sources. VOSS will be mounted on the MMPV Type I for Explosive Ordnance Disposal (EOD) and MMPV Type II for Engineers. VOSS will integrate and qualify a Geo-location capability, and develop and integrate a new, less costly, more reliable, sustainable and durable Infrared (IR) camera. VOSS will not require any FY2019 base funding.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>	Project (Number/Name) 415 / <i>Mine Neutral/Detection</i>

The Multifunction Video Display (MVD) provides view/control capability of the enablers (Interrogation Arms, VOSS, Man Transportable Robotic System (MTRS), Drivers Vision Enhancement, Vehicle Situational Awareness Cameras) in the MMPV Type II to all Operators. New capabilities will be added into that display to view and control future Unmanned Ground Vehicle Systems (UGVs) programs Route Clearance & Integration System (RCIS) and Husky Mounted Detection System (HMDS), Explosive Hazard Pre-Detonation (EHP) Roller and view Unmanned Aerial Vehicles video feeds. Additional software will need to be developed to add these capabilities. In addition, a new capability to push the video feeds of all of the enablers (Interrogation Arms, VOSS, Man Transportable Robotic System, Drivers Vision Enhancement and Vehicle Situational Awareness Cameras) from various vehicles within a Route Clearance Patrol will be developed.

Route Clearance Vehicle (RCV) & Enabler Improvements: Develop the hardware used to improve POR RCVs and Enablers

- Develop product upgrades to MMPV Type II Interrogation Arm so it can be operated by the MVD.
- Next Generation HMDS A2 to include Deep Buried Detection on the Husky and semi-autonomous control capability on the Husky and MMPV Type II
- Explosive Hazard Pre-Detonation (EHP) hardware upgrades
- Develop Interrogation Arm upgrades to the Buffalo MPCV
- Route Clearance Vehicle Acceleration Study
- Vehicle C4I Convergence
- Forward Reconnaissance and Explosive Hazard Detection (FREHD) Vehicle Integration

Force Protection Improvements/Add On Armor (AoA) to execute system level design cycle for Rocket Propelled Grenade (RPG) and explosive formed projectiles (EFP) AoA kits for Husky and Buffalo. Kits will be developed so that RPG and EFP protection can be installed at the same time. In order to do this lighter weight design solutions will be developed.

Explosive Hazard Pre-Detonation (EHP) capability to include a debris blower, Wire Neutralization System (WNS) and Mine Roller to neutralize/detonate a broad spectrum of improvised explosive hazards while on the move, to support route clearance mission.

TARDEC Software Center (SEC) provides support for the Explosive hazard Pre-Detonation (EHP) Roller, updating software throughout Test and Evaluation (T&E) and Low Rate Initial Production (LRIP) activities. The SEC will continue development of the EHP Roller software to integrate EHP Roller functionality with Multi-Visual Display (MVD). In addition, the SEC will develop a Software Integration Lab (SIL) to support integration as well as maintenance and troubleshooting improvements.

Standoff Robotic Explosive Hazard Detection System (SREHD), formerly known as the Autonomous Mine Detection System (AMDS), provides increased survivability through mine and explosive hazards stand-off detection, marking and neutralization capability for the dismounted soldier. It provides area access and freedom of movement for the Commander. SREHD consists of payload modules to be mounted on man-portable unmanned ground vehicles. The payloads are for surface laid and buried threats to include mines and explosive hazards. SREHD transitioned from Technical Development to Engineering and Manufacturing Development (EMD) in FY 2014. This capability allows a soldier to remain in a protective posture while detecting and neutralizing a wide variety of hybrid and conventional explosive threats.

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>	Project (Number/Name) 415 / <i>Mine Neutral/Detection</i>
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FY2019 Base funding of \$38.945 million includes \$27.681 million to support the continued development of the Husky Mounted Detection System (HMDS); \$9.350 million to support development and testing of RCIS Type I & II; \$0.500 million to support continued MVD development; \$0.425 million to support RCV and Enabler improvements; and \$0.989 million to support SREHD Developmental Testing (DT) corrective actions and Initial Operational Test and Evaluation (IOT&E) planning.

Explosive Hazard Protection for Mounted Clearance (EHPMC) provides a solution to mitigate capability gaps in force protection and system survivability to defeat improvised explosive devices and explosive hazards. Specific capability gaps include: limited vehicle force protection and system survivability capabilities and capability to extract casualties from the vehicles; and lack of capability to protect Soldiers heads, necks, and backs from the effects of explosive hazards blasts while seated inside vehicles, suppress external vehicle fires, and disconnect towed vehicles in emergency situations.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: HMDS Program Management Support</p> <p>Description: Husky Mounted Detection System (HMDS) Program Management Support</p> <p>FY 2018 Plans: Development of program documentation, acquisition package for Engineering Change Proposals (ECP), Type Classification/Materiel Release Activities, and development of logistics products.</p> <p>FY 2019 Base Plans: Will fund PMO Core and Matrix Support</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase is to support the continued development of the Husky Mounted Detection System (HMDS) through Engineering Change Proposals (ECPs). Provide engineering services to mature emerging capabilities.</p>	4.169	0.534	1.818	-	1.818
<p>Title: HMDS Ground Penetrating Radar (GPR)</p> <p>Description: HMDS Ground Penetrating Radar (GPR)</p>	0.203	-	-	-	-
<p>Title: HMDS Ground Penetrating Radar</p>	2.286	-	-	-	-
<p>Title: HMDS GPR: Engineer Change Proposal (ECP) to add Wire Detection and Infrared Illumination</p> <p>Description: HMDS A1 Tactical GPR: Engineer Change Proposal (ECP) to add Wire Detection and Infrared Illumination</p> <p>FY 2018 Plans:</p>	2.597	5.975	21.190	-	21.190

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>	Project (Number/Name) 415 / <i>Mine Neutral/Detection</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>RCIS Type I: Will support the incremental funding of two ongoing symbiotic EMD contracts; Semi-Autonomous Control (SAC) and Delta HMEE (digitization of the platform). EMD contract efforts include system design, integration, technical/test reviews, logistics development, testing and delivery of RCIS prototypes.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding requirements increase in FY 2019 as contractor performance spans a year compared to a partial year in FY 2018.</p>					
<p>Title: VOSS Geo-Location Capability & Infrared Camera Replacement</p> <p>Description: Vehicle Optics Sensor System (VOSS) capability to determine location of explosive hazards and IR Camera Replacement</p> <p>FY 2018 Plans: Geo-location close-out and finalization of technical data to be furnished to Tobyhanna Army Depot for fabrication of integration kit items and cables. Complete IR Camera specifications, technical information and requirements. Independently validate technical data package.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: VOSS does not require any funding in FY19.</p>	2.177	0.876	-	-	-
<p>Title: Multifunction Video Display (MVD)</p> <p>Description: Multifunction Video Display (MVD). Digital display used to control and view RCV enablers</p> <p>FY 2018 Plans: Continuing Support for MVD SIL at NVESD for development of additional enabler (Interrogation Arm software development for control functionality).</p> <p>FY 2019 Base Plans: Will continue Support for MVD SIL at Night Vision and Electronic Sensors Directorate (NVESD) for development of additional enabler (Interrogation Arm software development for control functionality).</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: MVD major test activities wrap up in FY18 so support only required to develop future capabilities in FY19</p>	0.750	0.750	0.500	-	0.500
<p>Title: RCV & Enabler Improvements</p> <p>Description: Develop the hardware used to improve POR RCVs.</p>	-	-	0.425	-	0.425

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 415 / Mine Neutral/Detection

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>FY 2019 Base Plans: Will continue to:</p> <ul style="list-style-type: none"> - Develop Interrogation Arm upgrades for the Buffalo Mine Protected Clearance Vehicle (MPCV). Demonstration of these upgrades will be performed. - Develop product upgrades to the Medium Mine Protected Vehicle (MMPV) Type II Interrogation Arm so it can be operated by the MVD. - Next Generation HMDS A2 to include Deep Buried Detection on the Husky and semi-autonomous control capability on the Husky and MMPV Type II - Explosive Hazard Pre-Detonation (EHP) hardware upgrades <p>FY 2018 to FY 2019 Increase/Decrease Statement: Not applicable (both years zero dollars)</p>					
<p>Title: Add on Armor (AoA)</p> <p>Description: Development AoA efforts for Route Clearance Vehicles (RCV) to include Rocket Propelled Grenade (RPG) and Explosive Formed Projectiles (EFP) for Husky and Buffalo.</p> <p>FY 2018 Plans: Prototype of Husky EFP AoA Kit</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding not available in FY19 to develop future Add-On Armor Kits. Additional funding to be provided in FY20.</p>	0.091	0.137	-	-	-
<p>Title: Software Engineering Center (SEC)</p> <p>Description: TARDEC SEC provides support for the Explosive Hazard Pre-Detonation (EHP) Roller, updating software throughout Test and Evaluation (T&E) and Low Rate Initial Production (LRIP) activities.</p> <p>FY 2018 Plans: Enhanced Explosive Hazard Pre-Detonation EHP Software for LRIP T&E activities.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Software support transitioning from RDTE to OPA bill as EHP achieves Milestone C.</p>	-	0.100	-	-	-
<p>Title: Standoff Robotic Explosive Hazard Detection (SREHD) (Formerly AMDS)</p> <p>Description: Standoff Robotic Explosive Hazard Detection (SREHD) (AMDS)</p>	7.441	3.054	0.989	-	0.989

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 415 / Mine Neutral/Detection

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<i>FY 2018 Plans:</i> Conduct Corrective Action Plans (CAPS) as a result of Developmental Testing (DT) and Conduct Initial Operational Testing and Evaluation (IOT&E)					
<i>FY 2019 Base Plans:</i> Will conduct Initial Operational Test and Evaluation (IOT&E)					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> IOT&E will conclude in the fourth quarter of FY 2019					
Accomplishments/Planned Programs Subtotals	31.747	19.848	38.945	-	38.945

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• R64001: HUSKY MOUNTED DETECTION SYSTEM (HMDS)	0.274	21.695	40.834	-	40.834	53.741	75.450	45.454	43.980	0.000	281.428
• R68102: GRND STANDOFF MINE DETECTN SYSM (GSTAMIDS)BLK 1	39.350	32.442	29.883	16.000	45.883	37.123	36.479	31.269	6.749	0.000	229.295
• DA0924: Modification Of In Svc Equip	189.456	148.587	78.507	186.377	264.884	80.864	59.713	66.333	71.186	0.000	881.023
• R68260: AREA MINE DETECTION SYSTEM (AMDS)	10.500	10.571	11.594	0.001	11.595	24.951	10.194	-	-	0.000	67.811
• 606: Cntrmn/Barrier Adv Dev	-	4.149	2.968	-	2.968	12.144	16.802	11.859	9.880	0.000	57.802
• M80400: Robotic Combat Support System (RCSS)	3.531	4.516	4.029	4.850	8.879	12.315	9.891	18.601	18.975	0.000	76.708
• E50510: DEMO KIT, BLASTING: Munition Array Charge, XM335	-	1.586	2.350	-	2.350	2.800	-	-	-	0.000	6.736

Remarks

D. Acquisition Strategy

The Husky Mounted Detection System (HMDS) program is pursuing an acquisition approach that delivers capability increments - Increment A, Configuration 1 (A1) to the Warfighter by leveraging the Quick Reaction Capability (QRC) Ground Penetrating Radar (GPR) currently deployed in support of Operation Enduring Freedom (OEF)

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>	Project (Number/Name) 415 / <i>Mine Neutral/Detection</i>
<p>and Operation Inherent Resolve (OIR). In FY2019, the program will continue to execute an Engineering Change Proposals (ECP) to add a wire detection capability to address evolving threat, and Infrared illumination to enable nighttime operation. A second ECP to improve operational availability of the HMDS during inclement weather and address obsolescence and Cyber Security deficiencies will begin in FY19.</p> <p>The Route Clearance & Interrogation System (RCIS) program executes an Engineering Manufacturing and Development (EMD) phase for Type I systems with an OEM contract award for Delta High Mobility Engineering Excavator (HMEE) support and a contract award to one EMD contractor for the Semi-Autonomous Control (SAC) Kit in FY 2018. The SAC Kit award will be based on a source selection from full and open competition. The SAC EMD contract awardee will execute Preliminary Design Review (PDR), design, integration, and build phase of seven Semi-Autonomous Capability (SAC) kits, integrated onto six vehicles, with one kit available for engineering and System Integration Lab (SIL) evaluations. These assets will be used for the Government to execute a full Pre-Production Qualification Test (PPQT) and be evaluated against Capability Production Document (CPD) and performance specification requirements. Production and Technical Data Package (TDP) procurement options on the EMD contract take advantage of competition to assist in cost reduction. The RCIS Type I program Lifecycle Cost Estimate (LCCE), and associated budget request, was updated based on costs associated with modifying the base HMEE platform to accept the SAC kit, changes in the acquisition strategy and alignment of development and test activities in support of a production decision. To support EMD, ALUGS is funding Reset/Recap of up to six Buffalo Mine Protected Clearance Vehicle (MPCV) test assets at Letterkenny Army Depot. These will be provided to the SAC contractor for Operator Control Unit (OCU) integration.</p> <p>The Vehicle Optics Sensor System (VOSS) program is pursuing an acquisition approach which harvests Quick Reaction Capability (QRC) procured systems for refresh and insertion into the Program of Record (POR). In FY 2018 VOSS will transition a qualified Geo-location capability and full technical data package for Government fabrication / manufacture, and complete requirements, interfaces and technical data to enable integration of a less costly, more sustainable and durable IR Camera. There are no planned activities in FY 2019.</p> <p>EHP Debris Blower was procured as a COTS item from a commercial vendor in FY 2016. EHP Roller and EHP Wire Neutralization System (WNS) will be procured starting in FY 2018. MVD will be procured through a sole source contract FY 2017. Spiral development of software upgrades to MVD will be procured in FY 2018. MMPV Type II Interrogation Arm Engineer Change Proposals/upgrades would be procured in the out years once the user identifies the upgrades needed.</p> <p>The Standoff Robotic Explosive Hazard Detection System (SREHD) (formerly known as AMDS) is currently in the Engineering Manufacturing Development (EMD) phase and is being developed to provide standoff detection, marking, and neutralization of explosive hazards (e.g., landmines, improvised explosive devices (IED), booby-traps (explosive), and unexploded ordnance (UXO)) in complex and urban terrain, including confined areas and subterranean environments (e.g., buildings, bunkers, tunnels, etc.). The EMD phase consists of a preliminary design phase, which culminates with the Preliminary Design Review (PDR), a Risk Reduction Test (RRT) to evaluate the preliminary design, a critical design phase, which culminates with the Critical Design Review (CDR), integration with the Talon IV chassis and the Remote Activation Munition System (RAMS), a prototype build of 11 systems, which will be used for integration activities and to conduct the Government Development Test (DT), and a Logistics Demonstration (LogDemo). Transition to Low Rate Initial Production (LRIP) is scheduled to occur in the 3rd Quarter of FY 2018 under PAA E50510 / DEMO KIT, BLASTING: Munition Array Charge, XM335, for the neutralization capability, as well under OPA R68260 / AREA MINE DETECTION SYSTEM (AMDS) for the detection and marking capabilities. Initial Operational Test and Evaluation (IOT&E) will start in the 4th Quarter of FY 2019 and conclude in the 1st Quarter of FY 2020 with LRIP assets. Award of the Full Rate Production (FRP) contract is scheduled to occur in the 2nd Quarter of FY 2020.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>	Project (Number/Name) 415 / <i>Mine Neutral/Detection</i>

<u>E. Performance Metrics</u> N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev				Project (Number/Name) 415 / Mine Neutral/Detection							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management - HMDS	MIPR	PM CCS : Picatinny Arsenal, NJ	32.507	-		-		-		-		-	0.000	32.507	-
HMDS System Engineering & Program Management	MIPR	PM Terrestrial Sensors : Fort Belvoir, VA	-	1.280		0.470		1.818	Jan 2019	-		1.818	Continuing	Continuing	Continuing
HMDS PMO SETA	SS/CPFF	TBD : TBD	-	0.400		0.064		-		-		-	Continuing	Continuing	-
Program Management - RCIS Type I	MIPR	PM FP : Warren, MI	2.829	1.360	Mar 2017	1.810		1.085	Oct 2018	-		1.085	Continuing	Continuing	-
Program Management - MTRS Inc II	MIPR	PM FP : Warren, MI	1.604	2.122	Jun 2017	-		-		-		-	0.000	3.726	-
VOSS Geo-location and new Infrared Camera	MIPR	PM Ground Sensors : Ft. Belvoir, VA	0.361	0.130		0.143		-		-		-	0.000	0.634	-
Program Management - SREHD (Formerly AMDS)	Allot	PM CCS : Picatinny Arsenal, NJ	3.504	0.222	Mar 2017	0.440	Mar 2018	0.044	Mar 2019	-		0.044	Continuing	Continuing	-
Subtotal			40.805	5.514		2.927		2.947		-		2.947	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
HMDS Inc A2 ? Integration of Deep Buried Detection and Wire Detection	SS/CPFF	NIITEK Dulles : VA	38.736	2.286		-		-		-		-	0.000	41.022	-
HMDS A1 Dev of Engineering Change Proposal w/ Wire Detect and InfraRed	SS/FFP	Chemring Sensors & Electronic Systems (CSES) : Dulles, VA	-	2.597		5.975		20.298	Jan 2019	-		20.298	Continuing	Continuing	Continuing
HMDS A1 Dev of Trainer WD, Test Kit Fabrication	SS/CPFF	NITEK : Dulles, VA	-	0.440		-		-		-		-	0.000	0.440	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604808A / Landmine Warfare/Barrier - Eng Dev				415 / Mine Neutral/Detection							
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
HMDS - TADSS	C/FFP	TBD - executed through PEO STRI : TBD	4.849	-		-		-		-		-	0.000	4.849	-
HMDS Systems Engineering Support	MIPR	CECOM : Various	-	-		-		0.892	Nov 2018	-		0.892	0.000	0.892	-
RCIS Type I	SS/FFP	J C Bamford : Pooler, GA	7.433	1.800		1.571		1.810	Nov 2018	-		1.810	0.000	12.614	Continuing
RCIS Type I test assets	MIPR	Letterkenny Army Depot : Letterkenny, PA	0.961	1.291		-		-		-		-	0.000	2.252	-
RCIS Type I SAC	C/CPIF	TBD : TBD	-	-		3.350	May 2018	4.631	Nov 2018	-		4.631	Continuing	Continuing	-
MTRS Inc II	C/FFP	PM FP, PdM UGV : Warren, MI	-	2.566	Sep 2017	-		-		-		-	0.000	2.566	-
VOSS Geo-location and Infrared Camera	C/CPFF	Various : Ft. Belvoir, VA	2.220	1.127		0.295		-		-		-	0.000	3.642	-
Multi-Function Video Display	C/CPFF	NVESD : Fort Belvoir, VA	3.472	0.250		0.250		0.500	Oct 2018	-		0.500	3.047	7.519	3.047
RCV & Enablers Improvements - MMPV Type II Interrogation Arm	C/CPFF	KRC : Houghton, MI	1.233	-		-		-		-		-	0.000	1.233	-
Buffalo MPCV Interrogation Arm Improvements	C/CPFF	KRC : Houghton, MI	-	-		-		0.425	Nov 2018	-		0.425	0.000	0.425	-
SREHD (Formerly AMDS) Engineering and Manufacturing Development (EMD)	C/CPIF	Carnegie Robotics LLC : Pittsburgh, PA	27.387	2.443	Jan 2017	1.150	Jan 2018	-		-		-	Continuing	Continuing	-
Subtotal			86.291	14.800		12.591		28.556		-		28.556	Continuing	Continuing	N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 415 / Mine Neutral/Detection
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
HMDS - Test Support	C/FFP	USI : Newport News, VA	1.421	-		-		-		-		-	0.000	1.421	-
HMDS - Tech Support	C/FFP	MANTECH : Fairfax, VA	1.473	0.233		0.175		-		-		-	Continuing	Continuing	-
HMDS	MIPR	NVESD/CERDEC : Fort Belvoir, VA	12.433	0.260		-		-		-		-	Continuing	Continuing	-
HMDS - Information Assurance	FFRDC	MITRE : McLean, VA	0.720	0.150		-		-		-		-	0.000	0.870	-
HMDS - LOG DEMO	C/CPFF	FIBERTEK : TBD	0.381	-		-		-		-		-	0.000	0.381	-
HMDS	MIPR	PM FP, PdM ALUGS : Warren, MI	4.429	-		-		-		-		-	0.000	4.429	-
HMDS - Cost Analysis	C/CPFF	CACI : va	0.048	-		-		-		-		-	0.000	0.048	-
HMDS	MIPR	PEO STRI : Orlando, FL	2.329	0.200		-		-		-		-	0.000	2.529	-
HMDS	MIPR	CECOM : Aberdeen, MD	4.064	0.400		-		-		-		-	Continuing	Continuing	-
HMDS - Test Data Plan Analysis	SS/CPFF	IDA : Alexandria, VA	0.910	0.360		-		-		-		-	0.000	1.270	-
HMDS	MIPR	MSCoE : Ft. Leonard Wood, MO	0.119	0.115		-		-		-		-	Continuing	Continuing	-
HMDS	MIPR	Various : Various locations	2.873	-		-		-		-		-	0.000	2.873	-
HMDS	MIPR	Product Realization Directorate (PRD)/CERDEC : Aberdeen, MD	1.543	0.360		-		-		-		-	Continuing	Continuing	-
HMDS	MIPR	ARDEC : Picatinny Arsenal, NJ	2.425	0.614		-		-		-		-	0.000	3.039	-
HMDS	MIPR	ADM : Edgewater, MD	1.206	-		-		-		-		-	0.000	1.206	-
HMDS	MIPR	AMRDEC : Redstone Arsenal, AL	1.021	-		-		-		-		-	0.000	1.021	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 415 / Mine Neutral/Detection
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
HMDS	MIPR	TARDEC : Warren, MI	0.545	-		-		-		-		-	0.000	0.545	-
RCIS Type I	MIPR	TARDEC, TACOM : Warren, MI	6.636	0.882	Mar 2017	1.150		1.364	Oct 2018	-		1.364	Continuing	Continuing	-
Robotics Interoperability	MIPR	PM FP, PdM ALUGS : Warren, MI	3.960	-		-		-		-		-	0.000	3.960	-
MTRS Inc II	Various	PM FP, PdM UGV : Warren, MI	8.705	1.441	Aug 2017	-		-		-		-	0.000	10.146	-
VOSS Geo-location and Infrared Camera	MIPR	Various : Various	2.720	-		0.379		-		-		-	0.000	3.099	-
Multi-function Video Display	C/CPFF	NVESD/CERDEC : Fort Belvoir, VA	2.797	0.500		0.500		-		-		-	0.000	3.797	-
Add on Armor (AoA) Husky RPG Kit	MIPR	TARDEC : Warren, MI	0.283	-		-		-		-		-	0.000	0.283	-
AoA Husky AoA Kit	MIPR	TARDEC : Warren, MI	-	0.091		0.137		-		-		-	0.000	0.228	-
EHP Roller Development	MIPR	TARDEC : Warren, MI	0.400	-		-		-		-		-	0.000	0.400	-
EHP Blower Camera Upgrade	MIPR	TARDEC : Warren, MI	0.050	-		-		-		-		-	0.000	0.050	-
SREHD (Formerly AMDS)	MIPR	Various : Various	9.092	2.303	Jan 2017	0.890	Jan 2018	0.240	Jan 2019	-		0.240	Continuing	Continuing	-
Subtotal			72.583	7.909		3.231		1.604		-		1.604	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
HMDS	MIPR	ATEC : Alexandria, VA	4.486	-		0.316		3.781	Mar 2019	-		3.781	Continuing	Continuing	Continuing
HMDS	MIPR	CECOM : Various	-	-		-		0.892	Nov 2018	-		0.892	0.000	0.892	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 415 / Mine Neutral/Detection
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
RCIS Type I	MIPR	ATEC : Aberdeen, MD	1.739	-		0.050		0.460	Nov 2018	-		0.460	0.000	2.249	-
MTRS Inc II	MIPR	TARDEC, Various : Warren, MI	1.000	0.131	Mar 2017	-		-		-		-	0.000	1.131	-
VOSS Geo-location and new Infrared Camera	MIPR	ATEC : Alexandria, VA	3.893	0.920		0.059		-		-		-	Continuing	Continuing	Continuing
Multi-Function Video Display	WR	KRC : Houghton, MI	1.100	-		-		-		-		-	0.000	1.100	-
RCV & Enabler Improvements ?MMPV Type II Interrogation Arm.	MIPR	TARDEC : Warren, MI	0.367	-		-		-		-		-	0.000	0.367	-
Add on Armor (AoA) Husky RPG	MIPR	ATEC : Aberdeen, MD	0.100	-		-		-		-		-	0.000	0.100	-
Add on Armor Buffalo EFP	MIPR	ATEC : Aberdeen, MD	0.300	-		-		-		-		-	0.000	0.300	-
Add-on Armor	MIPR	ARL : Adelphi, MD	0.100	-		-		-		-		-	0.000	0.100	-
Software Engineering Center (SEC)	MIPR	TARDEC : Warren, MI	-	-		0.100		-		-		-	0.000	0.100	-
SREHD (Formerly AMDS)	MIPR	ATEC : Various	1.868	2.473	Aug 2017	0.574	Aug 2018	0.705	Aug 2019	-		0.705	Continuing	Continuing	-
Subtotal			14.953	3.524		1.099		5.838		-		5.838	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	214.632	31.747	19.848	38.945	-	38.945	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 415 / Mine Neutral/Detection

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
HMDS																																
HMDS Increment A1 - MS C Review																													3 A1 MS C			
HMDS Increment A1-TC/MR																													6 A1 TC/MR			
HMDS Increment A1-FUE																													7 A1 FUE			
HMDS Increment A1-IOC																													10 A1 IOC			
HMDS Increment A1 Award ECP for WD																													A1 ECP WD			
HMDS Risk Reduction/ECP																													A1 V1 RR/ECP			
HMDS Increment A1 wWD FUE																													13 HMDS ECP wWD FUE			
HMDS Testing																																
RCIS Type I and Type II																																
RCIS Type I MS B	9 MS B																															
RCIS Type I EMD SAC Contract	EMD SAC Contract																															
RCIS Type I EMD support contract Digitized HMEE	EMD Support contract																															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 415 / Mine Neutral/Detection

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
RCIS Type I Testing													RCIS Type I testing																			
RCIS Type I MS C																					14 MS C											
RCIS Type I Low Rate Initial Production (LRIP)																					LRIP											
RCIS Type I Full Rate Production (FRP)																													FRP			
RCIS Type I Fielding																													RCIS Type I fielding			
RCIS Type II MDD																	11 RCIS Type II MDD															
RCIS Type II MS B Documentation Development																					Type II Doc Development											
RCIS Type II MS B																									16 RCIS Type II MS B							
RCIS Type II EMD contract																									RCIS Type II EMD Contract							
MTRS																																
MTRS PDR					5 PDR																											
MTRS Inc II MS B/C	1 MS B/C																															
MTRS Inc II Contract Award	2 Contract Award																															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>		Project (Number/Name) 415 / <i>Mine Neutral/Detection</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
VOSS																													
Geo-location Qualification	█																												
Geo-location Operation Test																													▲ 4
Infrared Camera Integration	█																												
Infrared Camera Qualification					█																								
RCV & Enablers																													
Buffalo IA Upgrade									█																				
EHP Equipment Upgrades													█																
RCV Acceleration Study													█																
Buffalo RPG Kit reverse engineer																	█												
RPG Defeat Add on Armor Husky																													▲ 16
RPG Defeat Add on Armor Husky LRIP Testing																													▲ 17
RPG Defeat Add on Armor Husky FRP																													▲ 19

▲
16
Prototype Development
 ▲
17
LRIP Testing
 ▲
19
Full Rate Production

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 415 / Mine Neutral/Detection	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
EHP Roller Development	Development																											
EFP Defeat Add on Armor Research continuation w/ ARL													Development															
EFP Defeat Add on Armor Prototype Development (Buffalo)																	Prototype Development											
EFP Defeat Add on Armor LRIP (Buffalo)																					LRIP							
EFP Defeat Add on Armor LRIP Testing (Buffalo)																					LRIP Testing							
EFP Defeat Add on Armor FRP (Buffalo)																												
EFP Defeat Add on Armor LRIP (Husky)																					LRIP							
EFP Defeat Add on Armor LRIP Testing (Husky)																					LRIP Testing							
EFP Defeat Add on Armor FRP (Husky)																												
MVD																												
MVD Operational Testing																												
(1) MVD Production																									▲ 21			
MVD Production Cut-In																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>	Project (Number/Name) 415 / <i>Mine Neutral/Detection</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MVD to Incorporate EHP/Spiral Software Development																												
MVD Future Incremental Capability Upgrades/Spiral Software Development																												
EHMPC Design Solutions / Market Survey																												
EHPMC - Back Shock & Seat Extractment Development																												
EHPMC - External Fire Suppression Development																												
EHPMC - Quick Disconnect Vehicle Recovery																												
Standoff Robotic Explosive Hazard Detection (SREHD) (Formerly AMDS)																												
SREHD Developmental Test (DT)																												
SREHD Regression Testing																												
SREHD Milestone C Low Rate Initial Production (LRIP)																												
SREHD Logistics Demonstration (Log Demo)																												
SREHD Initial Operational Test and Evaluation (IOT&E)																												
SREHD Full Rate Production (FRP)																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>	Project (Number/Name) 415 / <i>Mine Neutral/Detection</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
SREHD Initial Operational Capability (IOC)																					15 IOC											
SREHD Full Operational Capability (FOC)																													20 FOC			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>	Project (Number/Name) 415 / <i>Mine Neutral/Detection</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
HMDS	1	2016	1	2023
HMDS Increment A1 - MS C Review	4	2017	4	2017
HMDS Increment A1-TC/MR	1	2018	1	2018
HMDS Increment A1-FUE	3	2018	3	2018
HMDS Increment A1-IOC	3	2019	3	2019
HMDS Increment A1 Award ECP for WD	3	2018	4	2020
HMDS Risk Reduction/ECP	2	2017	1	2023
HMDS Increment A1 w/WD FUE	4	2020	4	2020
HMDS Testing	2	2018	1	2023
RCIS Type I and Type II	1	2015	4	2022
RCIS Type I MS B	3	2018	3	2018
RCIS Type I EMD SAC Contract	3	2018	1	2021
RCIS Type I EMD support contract Digitized HMEE	3	2018	3	2021
RCIS Type I Testing	4	2019	4	2020
RCIS Type I MS C	1	2021	1	2021
RCIS Type I Low Rate Initial Production (LRIP)	1	2021	1	2023
RCIS Type I Full Rate Production (FRP)	1	2023	2	2027
RCIS Type I Fielding	2	2023	3	2027
RCIS Type II MDD	1	2020	1	2020
RCIS Type II MS B Documentation Development	1	2020	3	2021
RCIS Type II MS B	3	2021	3	2021
RCIS Type II EMD contract	3	2021	1	2025

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>	Project (Number/Name) 415 / <i>Mine Neutral/Detection</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
MTRS	1	2016	3	2017
MTRS PDR	1	2018	1	2018
MTRS Inc II MS B/C	3	2017	3	2017
MTRS Inc II Contract Award	3	2017	3	2017
VOSS	1	2016	1	2020
Geo-location Integration	1	2016	4	2016
Geo-location Qualification	1	2017	4	2017
Geo-location Operation Test	4	2017	4	2017
Infrared Camera Integration	1	2017	4	2017
Infrared Camera Qualification	1	2018	4	2018
RCV & Enablers	1	2016	4	2022
Buffalo IA Upgrade	1	2019	3	2019
EHP Equipment Upgrades	2	2020	4	2020
RCV Acceleration Study	2	2020	4	2020
Buffalo RPG Kit reverse engineer	2	2021	4	2021
RPG Defeat Add on Armor Husky	4	2022	4	2022
RPG Defeat Add on Armor Husky LRIP Testing	3	2022	3	2022
RPG Defeat Add on Armor Husky FRP	4	2022	4	2022
EHP Roller Development	1	2016	2	2017
EFP Defeat Add on Armor Research continuation w/ ARL	1	2020	2	2020
EFP Defeat Add on Armor Prototype Development (Buffalo)	2	2021	4	2021
EFP Defeat Add on Armor LRIP (Buffalo)	2	2022	3	2022
EFP Defeat Add on Armor LRIP Testing (Buffalo)	3	2022	4	2022
EFP Defeat Add on Armor LRIP (Husky)	3	2022	3	2022
EFP Defeat Add on Armor LRIP Testing (Husky)	4	2022	4	2022

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>	Project (Number/Name) 415 / <i>Mine Neutral/Detection</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
MVD	1	2018	1	2024
MVD Operational Testing	4	2017	1	2019
(1) MVD Production	1	2023	1	2023
MVD Production Cut-In	1	2018	1	2023
MVD to Incorporate EHP/Spiral Software Development	1	2018	4	2018
MVD Future Incremental Capability Upgrades/Spiral Software Development	1	2018	4	2021
EHMPC Design Solutions / Market Survey	2	2021	4	2021
EHPMC - Back Shock & Seat Extractment Development	2	2022	4	2022
EHPMC - External Fire Suppression Development	2	2022	4	2022
EHPMC - Quick Disconnect Vehicle Recovery	2	2022	4	2022
Standoff Robotic Explosive Hazard Detection (SREHD) (Formerly AMDS)	1	2017	4	2022
SREHD Developmental Test (DT)	1	2017	3	2017
SREHD Regression Testing	4	2017	2	2018
SREHD Milestone C Low Rate Initial Production (LRIP)	3	2018	3	2018
SREHD Logistics Demonstration (Log Demo)	3	2019	4	2019
SREHD Initial Operational Test and Evaluation (IOT&E)	4	2019	4	2019
SREHD Full Rate Production (FRP)	2	2020	2	2020
SREHD Initial Operational Capability (IOC)	2	2021	2	2021
SREHD Full Operational Capability (FOC)	1	2023	1	2023

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 434 / Anti-Personnel Landmine Alternatives (NSD)
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
434: Anti-Personnel Landmine Alternatives (NSD)	-	0.000	4.100	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.100
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Spider Increment 1A will build upon the existing M7 Spider system. The M7 Spider system is a hand-emplaced, remotely controlled (Man-In-The-Loop) system that provides highly responsive terrain-shaping and protection capabilities. M7 Spider replaces persistent anti-personnel landmines, is compliant with US National Landmine policy, and has been fielded to US forces in support of Operation Enduring Freedom and currently being fielded to Engineers within Brigade Combat Teams in the Active and Army National Guard components. Additional capabilities will be developed to enhance the Spider Remote Control Station and demonstrate the ability to employ legacy Government-Off-The-Shelf (GOTS) lethal and non-lethal anti-personnel (AP) munitions and counter mobility obstacles. Spider Increment 1A will utilize an open system architecture to facilitate future munition integration.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: Engineering Support</p> <p>Description: Perform engineering support.</p> <p>FY 2018 Plans: Continue to support development of Spider Increment 1A system. Monitor Initial Operation Test (IOT).</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: There is no FY19 RDTE budget to compare against the FY18 RDTE budget.</p>	-	0.713	-	-	-
<p>Title: Test and Evaluation</p> <p>Description: Provide support to Contractor/Government test activities.</p> <p>FY 2018 Plans: Execute Initial Operational Test (IOT).</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: There is no FY19 RDTE budget to compare against the FY18 RDTE budget.</p>	-	2.898	-	-	-
<p>Title: Program Management and Oversight</p> <p>Description: Program Management and support of Spider Increment 1A.</p>	-	0.328	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 434 / Anti-Personnel Landmine Alternatives (NSD)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>FY 2018 Plans: Perform overall program management support for the execution of the Spider Inc 1A development effort and oversee Government Qualification Testing. Manage the Initial Operational Test (IOT).</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: There is no FY19 RDTE budget to compare against the FY18 RDTE budget.</p>					
<p>Title: FY 2014-2016 Reductions</p> <p>Description: Small Business Innovative Research/Small Business Technology Transfer Program (SBIR/STTR) and Federally Funded Research & Development Centers (FFRDC) Reductions.</p> <p>FY 2018 Plans: Estimated Small Business Innovative Research (SBIR) costs are \$140,000. Estimated Small Business Technology Transfer Program (STTR) costs are \$21,000.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: There is no FY19 RDTE budget to compare against the FY18 RDTE budget.</p>	-	0.161	-	-	-
Accomplishments/Planned Programs Subtotals	-	4.100	-	-	-

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• B55501: SPIDER APLA Remote Control Unit	1.428	0.996	0.000	-	0.000	-	-	-	-	0.000	2.424
• B54020: Spider Family of Networked Munitions Incr	8.796	4.500	17.515	-	17.515	18.510	18.215	8.022	-	0.000	75.558

Remarks

D. Acquisition Strategy

The Engineering Manufacturing Development (EMD) contract was a competitively awarded Cost Plus Incentive Fee EMD contract with a one year Firm-Fixed Price (FFP) Low Rate Initial Production (LRIP) option. A Government Level 3 Technical Data Package (TDP) will be delivered as part of the EMD contract. The modified TDP at the end of LRIP will be the basis of a Full Rate Production (FFP) contract.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 434 / Anti-Personnel Landmine Alternatives (NSD)

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 434 / Anti-Personnel Landmine Alternatives (NSD)
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Spider - Program Mgmt	Various	PM-CCS, : Picatinny Arsenal, NJ	4.029	-		0.328		-		-		-	Continuing	Continuing	-
SBIR/STTR, FFRDC and Section 3001/3004 ATB Adjustments	Various	PM CCS, : Picatinny Arsenal, NJ	3.686	-		0.161		-		-		-	0.000	3.847	-
Subtotal			7.715	-		0.489		-		-		-	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Spider Non-Lethal Launcher (FY12)	SS/CPIF	Alliant Techsystems Operations, LLC : Plymouth, MN	0.667	-		-		-		-		-	0.000	0.667	-
Spider Inc 1A (FY13-16)	C/CPIF	Northrop Grumman Systems Corporation : Carson, CA	29.819	-		-		-		-		-	Continuing	Continuing	-
Rifleman Radio Systems	Reqn	General Dynamics, C4 Systems : Scottsdale, AZ	0.057	-		-		-		-		-	0.000	0.057	-
Subtotal			30.543	-		-		-		-		-	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Spider - ARDEC Eng support	MIPR	ARDEC, : Picatinny Arsenal, NJ	15.101	-		0.683		-		-		-	Continuing	Continuing	-
Spider - ARDEC Non-Lethal Launcher Eng Spt	MIPR	ARDEC, : Picatinny Arsenal, NJ	1.561	-		-		-		-		-	0.000	1.561	-
Mitre provide C4 Support	FFRDC	Mitre, : McLean, VA	3.272	-		-		-		-		-	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604808A / Landmine Warfare/Barrier - Eng Dev				434 / Anti-Personnel Landmine Alternatives (NSD)							
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Spider - Millennium Engineering Support	C/FFP	Millennium : Arlington, VA	2.782	-		-		-		-		-	Continuing	Continuing	-
Contractor Engineering Support	C/FFP	TBD : TBD	-	-		0.030		-		-		-	0.000	0.030	-
Spider - CECOM Engineering Support MOD	C/CPFF	URS Federal Support Service : Lakehurst, NJ	0.390	-		-		-		-		-	0.000	0.390	-
Spider - CERDEC Engineering Support	C/CPFF	AASKI Technologies, INC : Chantilly, VA	0.281	-		-		-		-		-	0.000	0.281	-
Spider - CERDEC Eng support	MIPR	CERDEC - SPACE AND TERRESTRIAL COMMS DIR : APG, MD	0.330	-		-		-		-		-	Continuing	Continuing	-
Spider Increment 1A PEO STRI Training Support	MIPR	PEO STRI : Orlando, FL	0.150	-		-		-		-		-	0.000	0.150	-
ARL HRED MANPRINT/HFE Support	MIPR	ARL HRED : Adelphi, MD	0.468	-		-		-		-		-	0.000	0.468	-
Night Vision Electronic Sensors Directorate	C/CPFF	Fibertek : Herndon, VA	0.163	-		-		-		-		-	0.000	0.163	-
Spider 1A Maint & Engr SPT DOTC Contract	C/CPFF	Advanced Technology International (ATI) : North Charleston, SC	0.194	-		-		-		-		-	0.000	0.194	-
Spider 1A Maint & Engr SPT IDIQ Contract	C/IDIQ	Advanced Technology International (ATI) : North Charleston, SC	0.168	-		-		-		-		-	0.000	0.168	-
Natick	MIPR	Natick Soldier RDEC : Natick, MA	0.029	-		-		-		-		-	0.000	0.029	-
Subtotal			24.889	-		0.713		-		-		-	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 434 / Anti-Personnel Landmine Alternatives (NSD)
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Support Contractor/ Government Test Activities	MIPR	OTC, AMSAA, AEC, ATEC, NIE, TSMO, ARDEC : Various	3.502	-		2.898		-		-		-	Continuing	Continuing	-
Subtotal			3.502	-		2.898		-		-		-	Continuing	Continuing	N/A

Remarks
Not Applicable

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	66.649	-	4.100	-	-	-	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / Landmine Warfare/Barrier - Eng Dev	Project (Number/Name) 434 / Anti-Personnel Landmine Alternatives (NSD)

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Spider Increment 1A Development	[Red bar]				[Red bar]																							
Government DT	[Red bar]				[Red bar]																							
MS C Documentation	[Red bar]				[Red bar]																							
MS C			▲ 1 MS C		[Red bar]																							
Interactive Electronic Training Manual (IETM) Validation (2)	[Red bar]						■ IETM																					
Force Development Test (FDT)	[Red bar]						■ FDT																					
Initial Operational Test (IOT)	[Red bar]							■ IOT																				
Full Rate Production (FRP) Decision	[Red bar]				[Red bar]						▲ 2 FRP																	
Initial Operational Capability (IOC)	[Red bar]				[Red bar]									▲ 3 IOC														

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604808A / <i>Landmine Warfare/Barrier - Eng Dev</i>	Project (Number/Name) 434 / <i>Anti-Personnel Landmine Alternatives (NSD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SPIDER Networked Munitions Increment 1A	1	2004	1	2005
Request For Proposal (RFP)	1	2013	1	2013
Source Selection	2	2013	4	2013
Spider Increment 1A Development	4	2013	4	2017
Contractor DT	3	2014	4	2015
Government DT	3	2015	3	2017
Limited User Test (LUT)	2	2016	3	2016
MS C Documentation	2	2016	3	2017
MS C	3	2017	3	2017
Interactive Electronic Training Manual (IETM) Validation (2)	3	2018	3	2018
Force Development Test (FDT)	3	2018	3	2018
Initial Operational Test (IOT)	4	2018	1	2019
Full Rate Production (FRP) Decision	2	2019	2	2019
Initial Operational Capability (IOC)	3	2019	3	2019

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	169.375	164.409	178.693	-	178.693	128.654	113.562	114.008	118.061	Continuing	Continuing
323: Common Hardware Systems	-	4.636	5.190	4.879	-	4.879	5.565	5.083	4.169	4.286	0.000	33.808
334: Common Software	-	3.176	0.842	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.018
C29: Centralized Technical Support Facility (CTSF)	-	2.517	4.918	8.816	-	8.816	8.711	8.601	8.280	8.742	0.000	50.585
C34: Army Tac C2 Sys Eng	-	8.654	7.767	9.394	-	9.394	9.483	9.716	9.985	11.706	0.000	66.705
EJ4: COMMAND POST COMPUTING ENVIRONMENT (CPCE)	-	90.254	61.576	35.018	-	35.018	20.650	1.805	1.843	1.881	0.000	213.027
EJ5: MOUNTED COMPUTING ENVIRONMENT (MCE)	-	16.202	16.949	19.190	-	19.190	8.200	0.000	0.000	0.000	0.000	60.541
EJ6: TACTICAL ENHANCEMENT	-	12.907	0.000	17.873	-	17.873	11.862	9.884	0.000	0.000	0.000	52.526
EJ7: TACTICAL DIGITAL MEDIA	-	1.572	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.572
EK9: TACTICAL NETWORK OPERATIONS AND MANAGEMENT	-	0.000	9.348	10.514	-	10.514	8.691	27.434	30.207	35.483	0.000	121.677
EQ8: Mobile/Handheld Computing Environment (M/HHCE)	-	17.680	11.850	9.489	-	9.489	9.562	9.765	8.874	8.107	Continuing	Continuing
ER9: Command Post Integrated Infrastructure	-	0.000	20.000	44.685	-	44.685	15.391	12.453	25.317	27.339	Continuing	Continuing
EW3: Unit Task Reorganization (UTR) Development	-	11.777	25.969	18.835	-	18.835	30.539	28.821	25.333	20.517	0.000	161.791

A. Mission Description and Budget Item Justification

Project 323, the Common Hardware Systems (CHS) program, acquires and sustains highly flexible, customized, cost effective, common, and simplified non-developmental Command, Control, Communications, Computers, Combat Systems, Intelligence, Surveillance, and Reconnaissance (C5ISR) solutions that improve

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	
<p>interoperability and connectivity on the battlefield while garnering efficient competition to integrate the latest commercial technology onto the Army tactical network. CHS provides technical support, environmental and evaluation testing, system design, and end of life/configuration management across Army tactical programs to ensure interoperability and integration of hardware throughout the development of capabilities. CHS hardware evaluations facilitate and simplify the selection of common hardware solutions across the operational battlefield. CHS creates efficiencies through the acquisition of streamlined common hardware configurations across the Common Operating Environments (COE)s, the sustainment community, and tactical programs. CHS also provides logistical services to include worldwide 72-hour turnaround repair through strategically located support centers for tactical military units, manages customizable warranty, maintenance and failure rate reporting, and technical support services to support specific Army program requirements.</p> <p>Project 334, the Common Software (CS) program, is the suite of systems through which the Army develops, integrates and tests common software products and/or components used for communication between Army Mission Command Systems and Joint and coalition Command and Control (C2) applications. The CS project provides state-of-the-art software technologies and functionality that is used by numerous Mission Command (MC) and joint systems to eliminate the need for service independent development and duplication of effort. The CS project also manages and performs technology demonstrations of emerging technologies for future use by Army C2 systems. The CS program is a cornerstone in the Army's COE modernization efforts. There is no FY19 RDTE funding since Common SW will be transitioning into sustainment in FY19.</p> <p>Project C29, the Central Technical Support Facility (CTSF), is the Army's single strategic facility responsible for executing Army Interoperability Certification (AIC) system of system verification/validation checkout, testing, and configuration management for the Army's LandWarNet Baseline.</p> <p>Project C34 funds the PEO Command, Control, Communications-Tactical (PEO C3T) Technical Management Division (TMD), which effectively manages the System-of-Systems engineering, Enterprise and Integration efforts for the continuing evolution of the network within the PEO C3T portfolio of technology across the capability enhancement packages to deliver efficient and effective cross-domain technical solutions.</p> <p>Project EJ5, the Mounted Computing Environment (MCE), is one of the six computing environments (CEs) formalized by the AAE under the Common Operating Environment (COE) initiative. MCE standardizes end-user environments and enables streamlined deployment of new warfighting applications. The JBC-P is the foundational hardware element of the MCE. MCE enables Mission Command capability development to echelons from dismounted command nodes to echelons above corps, providing enhanced interoperability, and simplified end-user interface. Requirements for the MCE are established in the draft Mounted Computing Environment Information System Initial Capabilities Document (MCE IS CDD). FY2019 funding provides the means to continue to manage and develop MCE in concert with CPCE.</p> <p>Project EJ4, the Command Post Computing Environment (CPCE), is one of the computing environments under the Common Operating Environment (COE). It provides a common framework (Common Infrastructure / Common Services) upon which future Warfighter capabilities can be built. The CPCE targets Command and Control (C2) and Situational Awareness (SA) capability development at tactical echelons that span from Army Service Component Commands (ASCC) to company level. The CPCE will be the most critical computing environment developed to support the command posts and combat operations.</p> <p>Project EJ7, Tactical Digital Media (TDM), is comprised of photo, video and audio recording and editing equipment that will be assembled and issued as variant kits tailored to unit mission requirements. TDM kits address modernization gaps associated with all operational Combat Camera (COMCAM), Public Affairs (PA), and Military</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	
<p>Information Support Operations (MISO) units. TDM provides essential imagery, multimedia products, and live interview capabilities that directly contribute to successful execution of a Commander's strategic engagement and communications strategy across the full range of military operations. No FY19 RDTE funding.</p> <p>Project EK9, Tactical Network Operations (NetOps) Management (TNOM), will support the development and integration of the Tactical NetOps software capabilities in support of Network Operations (NetOps) Convergence, Army Objectives and emerging Cyber Center of Excellence (CCOE) requirements. The end state program is designed to synchronize LandWarNet, Network-enabled Mission Command, and Global Information Grid 2.0 Network Operations (NetOps) efforts in an integrated and interoperable framework, spanning all echelons of command and supporting the full range of military operations for Army, Joint, and Coalition Forces in order to ensure converged NetOps. The initial mission is convergence of DoD Information Network (DoDIN) functions into a single integrated set of Tactical NetOps and Management software. This integrated solution provides NetOps capability to manage Tactical Networks from the Soldier to the Theater network entry point and supports the implementation of integrated NetOps for Unified Network Operations (UNO). UNO will deliver a standardized visualization capability (integrating both Upper and Lower Tactical Internet NetOps) in order to reduce complexity and inform the military decision making processes. UNO will also provide enhanced capability to detect, respond, and restore from cyber incidents.</p> <p>Project ER9, Command Post Integrated Infrastructure (CPI2), fields mobile Command Post Nodes by integrating supporting mission command solutions in accordance with Directed Requirement with a FY20 First Unit Equipped in order to enhance the survivability and mobility of brigade and below command post formations. On order, Command Post Integrated Infrastructure will replace selected elements of the legacy command post to provide improved expeditionary capability, survivability, agility, and scalability for Corps and Division Main and Tactical Command Posts, Brigade Main and Tactical Command Posts, and Battalion Command Posts. It will ensure information and support systems are introduced into the Command Post through physical integration allowing the commander to tailor the Command Post as missions dictate.</p> <p>Project EQ8, Mobile/Handheld Computing Environment, supports the Nett Warrior (NW) Program (named in honor of Medal of Honor recipient Colonel Robert C. Nett), also known as the Ground Soldier System (GSS) Program. The program leverages commercial smart devices and secure Army tactical radios to provide the dismounted leader an integrated mission command and situational awareness system for use during combat operations. The NW system provides leaders electronic real-time information on friendly positions; information about enemy activity and movement; navigational data and map imagery; a collaborative planning tool; and other mission related graphics which effectively puts the power of the entire Army tactical network in the hands of the dismounted leader.</p> <p>Project EW3, Unit Task Reorganization (UTR), is the process performed by the S6 and their staff to affect change on the network in order to support the operational mission and dynamic nature of the Army. Currently network challenges exist during this process with regard to: maintaining accurate and up to date information, distributing configuration files and activating / re-establishing the network. UTR strives to make authoritative NETOPS available across all systems, reduce cognitive burden for soldiers to plan and manage the network and reduce manual touch labor.</p> <p>Project EJ6, Tactical Enhancement, supports the evaluation and testing requirements for Modular Communications Node - Advanced Equipment (MCN-AE), Terrestrial Transmission (TRILOS) and Troposcatter Transmission (TROPO) capabilities procured and fielded under the Signal Modernization (SIGMOD) funding line, B00010. TRILOS and TROPO will provide redundancy communications in a Satellite denied environment by providing improved Line of Site and beyond line of sight radio systems. SIGMOD Capabilities include:</p>		

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>
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MCN-AE: Provides Top Secret/Sensitive Compartmented Information (TS/SCI) communications to Brigades, Divisions, Corps, and Signal Battalions over the WIN-T network; TRILOS: Enables Mission Command in a Satellite Denied environment at higher throughput than the current High Capacity Line of Sight System (HCLOS). TRILOS: Enables Army units to reduce reliance on costly satellite bandwidth. TRILOS will extend the network by utilizing a significantly reduced Size, Weight and Power (SWaP) radio verses the aging HCLOS system. TROPO: Enables Mission Command in a Satellite Denied environment by providing Beyond Line of Site (BLOS) capability over longer ranges and at higher throughput than the current BLOS System. TROPO extends the network by utilizing a significantly reduced SWaP radio verses the current system. TROPO will enable Army units to reduce reliance on costly satellite bandwidth.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	205.590	164.409	189.277	-	189.277
Current President's Budget	169.375	164.409	178.693	-	178.693
Total Adjustments	-36.215	0.000	-10.584	-	-10.584
• Congressional General Reductions	-0.090	-			
• Congressional Directed Reductions	-9.816	-			
• Congressional Rescissions	-	-			
• Congressional Adds	7.500	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-26.815	-			
• SBIR/STTR Transfer	-6.994	-			
• Adjustments to Budget Years	-	-	-10.584	-	-10.584

Change Summary Explanation

FY 2019 Overall Base funding increase of \$7,498 million is driven by the following program changes and project funding realignments:

- Project 323 / Common Hardware Systems was decreased by \$0.659 million.
- Project 334 / Common Software was decreased by \$0.991 million.
- Project C29 / Centralized Technical Support Facility (CTSF) was increased by \$2.198 million.
- Project C34 / Army Tactical C2 Systems Engineering was increased by \$1.604 million.
- Project EJ4 / Command Post Computing Environment (CPCE) was decreased by \$1.494 million.
- Project EJ5 / Mounted Computing Environment (MCE) was increased by \$2.366 million.
- Project EJ6 / Tactical Enhancement was increased by \$9.273million.
- Project EK9 / Tactical Network Operations and Management was decreased by \$30.309 million.
- Project EQ8 / Mobile/Handheld Computing Environment (M/HHCE) was decreased by \$2.431 million.
- Project ER9 / Expeditionary Army Command Post was increased by \$15.455 million.
- Project EW3 / Unit Task Reorganization (UTR) Development was decreased by \$5.596 million. The FY 2019 funding request was reduced to account for the availability of prior year execution balances.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software				Project (Number/Name) 323 / Common Hardware Systems			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
323: Common Hardware Systems	-	4.636	5.190	4.879	-	4.879	5.565	5.083	4.169	4.286	0.000	33.808
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Common Hardware Systems (CHS) program acquires and sustains highly flexible, customized, cost effective, common, and simplified non-developmental C5ISR solutions that improve interoperability and connectivity on the battlefield while garnering efficient competition to integrate the latest commercial technology onto the Army tactical network. CHS provides technical support, environmental and evaluation testing, system design, and end of life/configuration management across Army tactical programs to ensure interoperability and integration of hardware throughout the development of capabilities. CHS hardware evaluations facilitate and simplify the selection of common hardware solutions across the operational battlefield. CHS creates efficiencies through the acquisition of streamlined common hardware configurations across the Common Operating Environments (COE)s, the sustainment community, and tactical programs. CHS also provides logistical services to include worldwide 72-hour turnaround repair through strategically located support centers for tactical military units, manages customizable warranty, maintenance and failure rate reporting, and technical support services to support specific Army program requirements.

FY 2019 funds support CHS to continue to manage the acquisition and delivery of CHS equipment and associated services in support of customer requirements. It will also provide technology insertions and the continued support for hardware and systems engineering, and evaluations. CHS will continue CHS-5 contract post-award activities.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Acquisition Management, System/ Configuration Management, and technical evaluation and testing of CHS equipment and services in support of program requirements Description: Funding is provided for the following effort	3.596	-	-	-	-
Title: CHS Technology Insertion in support of program capability requirements Description: Funding is provided for the following effort.	0.800	-	-	-	-
Title: Non Recurring Engineering (NRE) Costs for CHS-5 Products Description: Funding is provided for the following effort.	0.240	-	-	-	-
Title: Program Support and Acquisition Support for CHS and customer programs	-	3.010	2.699	-	2.699

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) 323 / Common Hardware Systems

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: Funding is provided for the following effort.</p> <p>FY 2018 Plans: Will continue CHS program support and acquisition support for CHS and customer programs.</p> <p>FY 2019 Base Plans: Will continue CHS program support and acquisition support for CHS and customer programs.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Core Labor will be paid from OMA funding.</p>					
<p>Title: Logistical service support for customer programs</p> <p>Description: Funding is provided for the following effort.</p> <p>FY 2018 Plans: Will continue CHS Logistical service support for customer programs.</p> <p>FY 2019 Base Plans: Will continue CHS Logistical service support for customer programs.</p>	-	0.623	0.623	-	0.623
<p>Title: Technical and Test Support for customer programs</p> <p>Description: Funding is provided for the following effort.</p> <p>FY 2018 Plans: Will continue CHS Technical and Test Support for customer programs.</p> <p>FY 2019 Base Plans: Will continue CHS Technical and Test Support for customer programs.</p>	-	1.557	1.557	-	1.557
Accomplishments/Planned Programs Subtotals	4.636	5.190	4.879	-	4.879

C. Other Program Funding Summary (\$ in Millions)
N/A
Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	Project (Number/Name) 323 / <i>Common Hardware Systems</i>

D. Acquisition Strategy

The overall goal is to improve interoperability, compatibility and sustainability and lower life cycle costs by standardizing battlefield command and control automation and other warfighting systems (net centric, etc) through centralized buys of modified/ruggedized non-developmental items. CHS will provide seamless, rapid, and consolidated procurement of commercial IT, customizable sustainment strategies, non-personal services, and continuous technology upgrades to support tactical programs fielding schedules. CHS provides a coherent migration strategy for acquisition of warfighting systems and new technology through the use of technology insertion. CHS also conducts common environmental testing of hardware items thereby reducing the testing requirements for individual Project Managers. CHS provides contractual tools that enable supported programs to effectively and efficiently establish organic sustainment support for commercial IT and utilizes hardware failure data and logistical analysis to support programs sustainment strategy decisions.

An Indefinite Delivery/Indefinite Quantity firm fixed priced, full and open competition contract was awarded to General Dynamics in May 2003, for ruggedization and production. In August 2011, CHS awarded, on a best value basis, the follow-on CHS-4 contract via full and open competition. CHS-5 is to be awarded in FY18 to provide flexibility for Tactical Programs of Record (PoR)s to meet hardware and associated services requirements through full and open competition and to provide an agile solution to support COE, network integration activities, capability set development, and logistical requirements.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604818A / Army Tactical Command & Control Hardware & Software				323 / Common Hardware Systems							
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Costs	C/FP	Various : Various	81.688	1.875	Dec 2016	-		-		-		-	0.000	83.563	-
Product Procurement	C/FP	Various : Various	90.456	1.721	Dec 2016	-		-		-		-	0.000	92.177	-
Technology Insertion	C/FP	Various : Various	16.980	0.800	Dec 2016	-		-		-		-	0.000	17.780	-
CHS-5 Non-Recurring Engineering	C/FP	Various : Various	0.232	0.240	Dec 2016	-		-		-		-	0.000	0.472	-
Program & Acquisition Support	C/FP	Various : Various	-	-		3.010		2.699	Dec 2018	-		2.699	Continuing	Continuing	Continuing
Technical & Test Support	C/FP	Various : Various	-	-		0.623		0.623	Dec 2018	-		0.623	Continuing	Continuing	Continuing
Logistical Service Support	C/FP	Various : Various	-	-		1.557		1.557	Dec 2018	-		1.557	Continuing	Continuing	Continuing
Subtotal			189.356	4.636		5.190		4.879		-		4.879	Continuing	Continuing	N/A
Project Cost Totals			189.356	4.636		5.190		4.879		-		4.879	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	Project (Number/Name) 323 / <i>Common Hardware Systems</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023											
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
Technology Insertion & Technical Support (Adding New Hardware)																																				
Environmental and First Article Testing																																				
RESET and Deep Cleaning/Out of Warranty Repair																																				
HW Implementation, Integration and Evaluation																																				
CHS-4 Hardware Deliveries																																				
CHS-5 Contract Award																	▲ 1																			
NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) Testing																					▲ 2															
HIGH ALTITUDE ELECTROMAGNETIC PULSE (HEMP) Testing																					▲ 3															
CHS-5 Hardware Deliveries																																				
CHS-6 Pre-Contract Award																																				

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) 323 / Common Hardware Systems

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
TSR-3 Ongoing Contract Management	1	2006	4	2013
CHS-3 Hardware Deliveries	2	2004	2	2014
OFS Support	1	2006	4	2014
Technology Insertion & Technical Support (Adding New Hardware to Contract)	1	2007	4	2023
Environmental and First Article Testing	1	2006	4	2023
RESET and Deep Cleaning/Out of Warranty Repair	1	2006	4	2023
HW Implementation, Integration and Evaluation	1	2006	4	2023
CHS-4 Hardware Deliveries	1	2012	4	2019
CHS-5 Contract Award	3	2018	3	2018
NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) Testing	3	2019	3	2019
HIGH ALTITUDE ELECTROMAGNETIC PULSE (HEMP) Testing	3	2019	3	2019
CHS-5 Hardware Deliveries	4	2018	3	2023
CHS-6 Pre-Contract Award	3	2020	4	2023

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) 334 / Common Software
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
334: Common Software	-	3.176	0.842	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	4.018
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Project 334 Common Software (CS): CS is the suite of systems through which the Army develops, integrates and tests common software products and/or components used for communication between Army Mission Command Systems and the greater Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) community. The CS project provides state-of-the-art software technologies and functionality that is used by numerous C4ISR and joint systems to eliminate the need for service independent development and duplication of effort. The CS program is the hub of interoperability for the Army's current C4ISR systems.

FY18 funding supports any remaining adjustments to ensure backwards compatibility with previous versions of Common Software products implementations.

There is no FY19 funding since CS will be transitioning into sustainment.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: Common Software development in support of the C4ISR community</p> <p>Description: Interoperability and Backwards Compatibility efforts</p> <p>FY 2018 Plans: Funding is provided for Common Software transition efforts and development of MOA with SEC to ensure all programmatic requirements are accounted for.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Common Software will be transitioning into sustainment in FY19.</p>	1.828	0.613	-	-	-
<p>Title: Software Development - Tactical Server Infrastructure (TSI)</p> <p>Description: Tactical Server Infrastructure (TSI) provides an integrated Server hardware and locally hosted Enterprise Service Infrastructure for use in tactical Army command posts. C2 infrastructure and data services hosted on TSI providing a common core infrastructure component to the C4ISR architecture</p>	0.713	-	-	-	-
<p>Title: Test and Evaluation</p> <p>Description: Test and Evaluation efforts include the planning and conduct of Test, Evaluation, and Integration events. This includes participation in Network Integration Exercises (NIEs), User Juries, Assessments, Risk</p>	0.300	0.174	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) 334 / Common Software

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Reduction Events (RREs), vulnerability testing, and Army Interoperability Certification (AIC) testing. Testing can consist of stand-alone capability testing in a lab/sandbox environment or full interoperability testing with multiple systems in an operational environments					
FY 2018 Plans: Test and Evaluation required for Common Software. Software testing documentation and training and AIC					
FY 2018 to FY 2019 Increase/Decrease Statement: Common Software will be transitioning into sustainment in FY19.					
Title: Program Management	0.335	0.055	-	-	-
Description: Program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning meetings and IPTs					
FY 2018 Plans: Program Management - Includes Core, Matrix, and Contractor support					
FY 2018 to FY 2019 Increase/Decrease Statement: Common Software will be transitioning into sustainment in FY19.					
Accomplishments/Planned Programs Subtotals	3.176	0.842	-	-	-

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

Remarks

D. Acquisition Strategy

The overall acquisition goal of the CS project is to provide common products that are used horizontally across programs, preventing duplication of effort by Army and Joint programs and facilitating life cycle cost efficiencies. All software development efforts will be competed among Capability Maturity Model Integration (CMMI) certified developers.

In accordance with the approved Net-enabled Mission Command Initial Capabilities Document (NeMC ICD), software capability will be developed in 3-year increments to facilitate messaging, mediation and addressing for Army, Joint and Coalition Partners. The product development funded under this R-Form is an integral part of the C4ISR systems, and a core communication component of the virtualized infrastructure and will be accomplished in part under a Project Manager, Mission Command

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army Date: February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	Project (Number/Name) 334 / <i>Common Software</i>
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(PM MC) General Services Administration (GSA) engineering services contract approach which will consist of multiple prime contractors competitively bidding on a single development solicitation. This strategy is designed to optimize opportunities for improved interoperability among the systems, to capture the benefits of competition, and to ensure the rapid integration of new capabilities into warfighter systems. This strategy is also designed to reduce the physical footprint, the logistics support requirements, and to increase operational efficiency by integration of additional system interoperability services which reduce duplication of effort and cost; and allows for development of communication standards across the DoD community.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) 334 / Common Software
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Office Management	Various	PM Mission Command : Aberdeen, MD	12.846	0.335	Jan 2017	0.055		-		-		-	Continuing	Continuing	-
Subtotal			12.846	0.335		0.055		-		-		-	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Common Software Product Engineering/Software Development	C/CPFF	Various Contractors : Various Locations	3.556	1.828	Feb 2017	-		-		-		-	Continuing	Continuing	-
Mission Command/Army System Engineering & Integration	C/CPFF	Future Skies : Wall Township, NJ	8.764	-		-		-		-		-	0.000	8.764	6.679
Engineering & Integration for Joint and Coalition Interoperability	C/CPFF	Various Contractors : Various Locations	3.362	-		-		-		-		-	Continuing	Continuing	-
Evaluation, modification, validation & integration of developed SW	C/CPFF	Various Contractors : Various Locations	5.808	-		-		-		-		-	0.000	5.808	4.159
Tactical Server Infrastructure and Application Development	C/CPFF	CECOM Software Engineering Center : APG, MD	4.558	0.713	Feb 2017	-		-		-		-	Continuing	Continuing	Continuing
Common Software Product Engineering/Software Development	C/FFP	FUTURE SKIES : Wall Twp, NJ	-	-		0.613		-		-		-	0.000	0.613	-
Subtotal			26.048	2.541		0.613		-		-		-	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) 334 / Common Software
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Developmental Test/ Operational Test	MIPR	Various : Various Locations	8.907	0.300		0.174		-		-		-	Continuing	Continuing	-
Subtotal			8.907	0.300		0.174		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	47.801	3.176	0.842	-	-	-	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) 334 / Common Software

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Common Software Dev & Test1																												
Test & Integration1	 v2 T&I1																											
AWA 17.1	 AWA 17.1																											
NIE 17.2	 NIE 17.2																											
Common Software Dev & Test2																												
Arch, System Engr & Dev2	 SE & Dev2																											
Test & Integration2	 T&I2																											
AWA 18.1	 AWA 18.1																											
NIE 18.2	 NIE 18.2 (v3 Operational Assessment)																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	Project (Number/Name) 334 / <i>Common Software</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Common Software Dev & Test1	2	2012	2	2017
Arch, System Engr & Dev1	2	2012	2	2016
Test & Integration1	1	2015	2	2017
AWA 17.1	1	2017	1	2017
NIE 17.2	3	2017	3	2017
Common Software Dev & Test2	4	2014	4	2018
Arch, System Engr & Dev2	4	2014	4	2018
Test & Integration2	2	2017	4	2018
AWA 18.1	1	2018	1	2018
NIE 18.2	3	2018	3	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software				Project (Number/Name) C29 / Centralized Technical Support Facility (CTSF)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
C29: Centralized Technical Support Facility (CTSF)	-	2.517	4.918	8.816	-	8.816	8.711	8.601	8.280	8.742	0.000	50.585
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project C29 - Centralized Technical Support Facility: The Central Technical Support Facility (CTSF) is the Army's premier test and certification facility for System of Systems interoperability, functioning as CIO/G6's designated independent test agent. CTSF is the Army's sole strategic facility responsible for conducting engineering support associated with test integration of Army LandWarNet/Mission Command (LWN/MC) architectures and baselines into the Army Interoperability Certification (AIC) system of systems environment, performing AIC testing and conducting configuration management for all operational and tactical level applications (individual systems, System of Systems, and Families of Systems) prior to fielding. The CTSF provides validated test data to the Department of the Army and Joint agencies to accredit interoperability certifications. The distributed test environment of the CTSF is accomplished through the Federation of Net-centric Sites (FaNS) construct. This FaNS construct addresses distributed integration development and testing using the core infrastructure of the CTSF to harness AMC, Army, and Joint expertise/resources. Through these federated resources, the CTSF executes interoperability development and certification testing of the Warfighter mission areas, to include Network Evaluation spinouts, as they digitize and become part of the Army's LandWarNet.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Army Interoperability Certification (AIC) Testing	0.885	3.494	7.110	-	7.110
<p>Description: Conduct Army Interoperability Certification (AIC), planning/coordination/scheduling/ and reporting of Common Operating Environment (COE) and software block testing (local and distributed). Provide stakeholders data collection/data analysis/data dissemination/simulation/stimulation verification/validation. Manage the set-up, configuration, integration, operations and maintenance of the LandWarNet/Mission Command (LWN/MC) systems within the CTSF test environments. Function as the CIO/G-6's Independent Test Agent for Program Managers of LWN/MC systems that have an Acquisition Life Cycle requirement for testing interoperability of software and associated hardware prior to fielding to the Warfighter. Report the results of Army Interoperability Certification Tests to the CIO/G-6, PM, and TRADOC communities to support updates to the G-3/5/7 managed baseline.</p> <p>FY 2018 Plans: Continue SWB11-12 test planning, test case development, test environment architecture set-up, to include information assurance software compliance, and software test tools. Conduct interoperability testing for the SWB11-12 systems that comprise the LWN/MC baseline. Continue work to define the testing methodology as</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C29 / Centralized Technical Support Facility (CTSF)

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>part of the Army transition to a COE strategy, while working to incrementally implement and utilize distributed CP test processes and test architectures that will comprise the Federated Integration Environment (FIE). Conduct COE v3.0 planning, test case development and architecture set-up incorporating CP testing construct for the Computing Environment (CE).</p> <p>FY 2019 Base Plans: Continue SWB11-12, and COE v3 and beyond test planning, test case development, test environment architecture set-up, to include information assurance software compliance, and software test tools. Conduct interoperability testing for the SWB11-12 systems that comprise the LWN/MC baseline. Support the ASA(ALT) led Interoperability and Integration Event (I2E) for COE v3.0. Conduct COE v3.0 planning, test case development and architecture set-up incorporating CP testing construct for the CE. Continue work to define the testing methodology as part of the Army transition to a COE strategy, while working to incrementally implement and utilize distributed CP test processes and test architectures that will comprise the Federated Integration Environment (FIE).</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Test execution transitioning to a single architecture representing the field (multiple baselines) with universal mission threads. FY19 increase supports a new operational requirement to run multiple simultaneous testing events.</p>					
<p>Title: Engineering Services</p> <p>Description: Provide network engineering support to establish and maintain tactical architectures on the CTSF test floors and to deploying/fielded units at training centers around the world (NIE, JRTC, NTC, JMRC). System engineering support provides hardware virtualization, advanced Host Based Security System (HBSS) support, system validation and integration support to numerous PMs on the integration and risk reduction labs, and assists Army programs with interoperability assessments and AIC rehearsal. Modify and merge army data products for CTSF test architectures. Develop/Maintain Applications for CTSF in-house programs.</p> <p>FY 2018 Plans: Support AIC Integration and Testing. Continue Network Integration Checkout prior to each AIC. Continue support to PMs for integration of future COE insertions and integration. Identify and incorporate software tools to monitor performance and assist in issue resolution. Integrate and implement HBSS technology. Assist PMs in the development of HBSS policies. Assist integration and test architectures to include Program of Record (POR) and non-POR radio communications devices to provide PMs and Materiel Developers testing in</p>	0.139	0.159	0.155	-	0.155

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C29 / Centralized Technical Support Facility (CTSF)

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>realistic environments. Provide CTSF network and systems engineering for validation of end-to-end sensor and platform communications and interoperability. Provide software patch validation; network support for integration and test floors; network support to fielded units upon request; and systems engineering and analysis support to system of systems integration activities. Provide PMs and CTSF Configuration Management (CM) with a Virtualization Suite and assist in virtualizing software. Plan and conduct engineering evaluations for AIC testing and data collection in the Network Integration Evaluation (NIE)/Capability Integration Evaluation (CIE) to leverage the operational environment and NIE/CIE resources. Support Army Warfare Assessment (AWA), Joint Users Interoperability Communications Exercise (JUICE), and Bold Quest technology and interoperability demonstrations. Assist Assistant Secretary of the Army (Acquisition, Logistics and Technology) [ASA(ALT)] in developing and refining Control Point Testing for COE and distributed testing between the Computing Environments (CEs). Assist the CEs in Federation of Net-Centric Sites (FaNS) accreditation for distributed testing. Assist ASA(ALT) in defining the COE architectures and services. Assist in interoperability issues for multiple Combatant Commands. Conduct radio Verification and Validation. Integrate One Semi-Automated Forces (OneSAF), the United States Army's next generation simulation system into CTSF test Architecture. Application Programmers continue to develop and modify Configuration Management Tool Suite version 3 (CMTS3) modules.</p> <p>FY 2019 Base Plans: Support AIC Integration and Testing. Continue Network Integration Checkout prior to each AIC. Continue support to PMs for integration of future COE insertions and integration. Identify and incorporate software tools to monitor performance and assist in issue resolution. Integrate and implement HBSS technology. Assist PMs in the development of HBSS policies. Assist integration and test architectures to include Program of Record (POR) and non-POR radio communications devices to provide PMs and Materiel Developers testing in realistic environments. Provide CTSF network and systems engineering for validation of end-to-end sensor and platform communications and interoperability. Provide software patch validation; network support for integration and test floors; network support to fielded units; and systems engineering and analysis support to system of systems integration activities. Provide PMs and CTSF Configuration Management (CM) with a Virtualization Suite and assist in virtualizing software. Plan and conduct engineering evaluations for AIC testing and data collection in the Network Integration Evaluation (NIE)/Capability Integration Evaluation (CIE) to leverage the operational environment and NIE/CIE resources. Support Army Warfare Assessment (AWA), Joint Users Interoperability Communications Exercise (JUICE), and Bold Quest technology and interoperability demonstrations. Assist Assistant Secretary of the Army (Acquisition, Logistics and Technology) [ASA(ALT)] in developing and refining Control Point Testing for COE and distributed testing between the Computing</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C29 / Centralized Technical Support Facility (CTSF)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Environments (CEs). Assist the CEs in Federation of Net-Centric Sites (FaNS) accreditation for distributed testing. Assist ASA(ALT) in defining the COE architectures and services. Assist in interoperability issues for multiple Combatant Commands. Conduct radio Verification and Validation. Application Programmers continue to develop and modify Configuration Management Tool Suite version 3 (CMTS3) modules.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Test execution transitioning to a single architecture representing the field (multiple baselines) with universal mission threads. No significant change from FY18 to FY19.</p>					
<p>Title: Configuration Management</p> <p>Description: As the CTSF Configuration Management Office, provide CM functional and physical configuration management and change management to the CTSF Army Interoperability Certification test floor environment. As Army Configuration Management Office (ACMO), establish and maintain oversight control of the Army Master Library for the Army Interoperability Certified Fielded Baseline (AICFB). Archive system software and data products, correlated with their associated documentation, for the Army LandWarNet Mission Command Baseline (ALWNMCB), a subset of the AICFB. Establish and maintain the configuration and change management to the AICFB and the ALWNMCB for Lifecycle Software Management (LCSM). Provide support to the Army Staff (ARSTAF), Material Developers (MATDEV), Project Managers (PM), and System Owners (SO) through the orderly management of product configuration information and product change management (ChM), which enables capability revisions, improved reliability and maintainability, extended life, and reduced cost. Maintain and improve the Configuration Management Tracking System version 3 (CMTSIII), the Army's authoritative database management system (DBMS) for configuration management (CM) of the systems comprising Coalition Interoperability Assurance and Validation (CIAV), and the Warfighter Mission and Business Mission Areas of the Army Information Technology (IT) portfolio. Assist the CIO/G6 in conducting accreditation inspections and training for Federation of Net-centric Sites (FaNS) locations.</p> <p>FY 2018 Plans: Provide CM functional and physical configuration management and change management to the CTSF Army Interoperability Certification test floor environment. Provide CM functional and physical configuration management and change management to the AIC Fielded Baseline, to include archiving the required system software, data products and documentation, while correlating the relevant data within the CMTSIII DBMS for visibility to users Army wide. Provide baseline reconciliation to the four quarterly CIO/G6 AICFB reports, identifying to commanders and their G-3/G-6 staff the Army's AIC certified, Interoperability Capability and Limitations assessed, AIC waived, and AIC exempted system software that is authorized to connect to the</p>	0.358	0.499	0.499	-	0.499

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C29 / Centralized Technical Support Facility (CTSF)

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Army?s network. Assist the CIO/G6 in conducting accreditation inspections and training for Federation of Net-centric Sites (FaNS) locations. Continue CMTSIII evolutionary developments: Streamline the Reproduction Distribution Installation Training (RDIT) support from four discrete modules into a single Software Management Module, adding capability and accountability. Automate the ASA (ALT) Configuration Control Board slides and certification requirements into CMTSIII; expand reporting outputs. Collaborate to obtain system accreditation for, and implement, the Configuration Management Tracking System Virtual Console (CMTSVC). Initiate changes to enable CMTSIII to maintain currency/compatibility with Common Operating Environment evolutionary developments. Define and establish the CM Continuity of Operations Plan (COOP) requirements.</p> <p>FY 2019 Base Plans: Provide CM functional and physical configuration management and change management to the CTSF Army Interoperability Certification test floor environment. Provide CM functional and physical configuration management and change management to the AICFB, to include archiving the required system software, data products and documentation, while correlating the relevant data within the CMTSIII DBMS for visibility to users Army wide. Provide baseline reconciliation to the four quarterly CIO/G6 AICFB reports, identifying to commanders and their G-3/G-6 staff the Army?s AIC certified, Interoperability Capability and Limitations assessed, AIC waived, and AIC exempted system software that is authorized to connect to the Army?s network. Assist the CIO/G6 in conducting accreditation inspections and training for Federation of Net-centric Sites (FaNS) locations. Continue CMTSIII evolutionary developments. Initiate changes to enable CMTSIII to maintain currency/compatibility with Common Operating Environment evolutionary developments.</p>					
<p>Title: Management Operations/Program Office</p> <p>Description: Provide management operations consisting of planning, programming and executing funds; planning and programming for required personnel; planning, programming and executing contracts supporting AIC testing processes; identifying reimbursable tests and collecting/allocating appropriate funds; planning and programming logistics activities, managing/controlling/documenting physical assets and inventories; and perform oversight and coordination of physical security with hosting installation.</p> <p>FY 2018 Plans: Assist development and implementation of CMTSIII Resource Management Module and Reporting as well as FMIS for use in documenting/programming/executing funds and personnel levels of effort associated with mission activities. Program and execute funding; plan and program manpower requirements and coordinate with CECOM G8 for implementation; identify contracting requirements and develop strategy for implementation in conjunction with CECOM Acquisition Center. Track testing schedule, prepare/coordinate/track customer funding</p>	1.135	0.766	1.052	-	1.052

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C29 / Centralized Technical Support Facility (CTSF)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>for AIC testing activities (e.g. COE v3.0 tests, CS 11-12 Bi-Annual testing, Joint, Coalition), and infrastructure support. Continue to provide field support coordination for unit training and exercises upon request. Maintain existing infrastructure while continuing to develop coordinate planning/engineering activities associated with transition to permanent facility; continue to enhance physical security, access control, force protection, COOP and EAP activities and exercises. Continue inventory accountability programs and asset control.</p> <p>FY 2019 Base Plans: Continue to utilize CMTSIII Resource Management Module and Reporting as well as FMIS for use in documenting/programming/executing funds and personnel levels of effort associated with mission activities. Program and execute funding; plan and program manpower requirements and coordinate with CECOM G8 for implementation; identify contracting requirements and develop strategy for implementation in conjunction with CECOM Acquisition Center. Track testing schedule, prepare/coordinate/track customer funding for AIC testing activities (e.g. COE v3.0 tests, CS 11-12 Bi-Annual testing, Joint, Coalition), and infrastructure support. Continue to provide field support coordination for unit training and exercises upon request. Maintain existing infrastructure while continuing to develop coordinate planning/engineering activities associated with transition to permanent facility; continue to enhance physical security, access control, force protection, COOP and EAP activities and exercises. Continue inventory accountability programs and asset control.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: CTSF has an increased operational requirement to execute multiple simultaneous events requiring additional labor to plan and execute.</p>					
Accomplishments/Planned Programs Subtotals	2.517	4.918	8.816	-	8.816

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

Remarks

D. Acquisition Strategy
Execute system of systems interoperability testing and certification through the use of Government and Systems Engineering and Technical Analysis (SETA) contract personnel experienced in product development and interoperability testing. Testing and certification occurs in a cyclical fashion, with an expectation of an annual Software Block/Capability Set test followed with cyclical test events (Bi-Annual Tests) to ensure integrity of software baselines to the Warfighter. Engineering Services provides strategic integration of software into a system of systems/family of systems environment to support interoperability testing. Establish and maintain

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	Project (Number/Name) C29 / <i>Centralized Technical Support Facility (CTSF)</i>

Configuration Management and version control of the Army's Interoperable Battle Command LandWarNet Baseline. Distributed testing capability uses local assets and leverages other federated test facilities to create synergy and realize efficiencies, to include system of system test efforts, where possible at 2/1 AD/WSMR (NIE/AWA).

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604818A / Army Tactical Command & Control Hardware & Software				C29 / Centralized Technical Support Facility (CTSF)							
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MITRE Corp	FFRDC	Engineering Services : Fort Hood, TX	17.178	-		-		-		-		-	0.000	17.178	-
In-House	Allot	Engineering Services : Fort Hood, TX	2.548	-		-		-		-		-	0.000	2.548	-
Subtotal			19.726	-		-		-		-		-	0.000	19.726	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CECOM Matrix	Allot	Program and Budget Analysis Support : Fort Hood, TX/ Aberdeen Proving Grounds, MD	3.936	0.183		0.463		0.741		-		0.741	Continuing	Continuing	Continuing
In-House Support	Allot	Management Operations, Logistics Support : Fort Hood, TX	9.928	-		-		-		-		-	0.000	9.928	-
ISSA/Training/TDY	Allot	Site Support Activities : Fort Hood, TX	-	0.062		0.244		0.250		-		0.250	Continuing	Continuing	Continuing
Supplies	C/UCA	Management Operations, Logistics Support : Fort Hood, TX	1.309	0.066		0.059		0.060		-		0.060	Continuing	Continuing	Continuing
Moving Costs	Allot	Management Operations, Logistics Support : Fort Hood, TX	-	-		-		0.001		-		0.001	0.000	0.001	Continuing
Subtotal			15.173	0.311		0.766		1.052		-		1.052	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C29 / Centralized Technical Support Facility (CTSF)
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			

Remarks
Under "open-the-door" cost model, all In-house support efforts are included under Test & Evaluation. Moving Costs associated with transitioning to permanent facility beginning in FY18.

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
CECOM R2 3G	C/CPFF	Test, Configuration Management : Fort Hood, TX	10.547	0.001	May 2018	0.340		3.610	May 2019	-		3.610	Continuing	Continuing	Continuing
CECOM S3	C/CPFF	Facilities, Maintenance, Security : Fort Hood, TX	8.606	0.394	Aug 2016	1.248		1.227	Aug 2019	-		1.227	Continuing	Continuing	Continuing
ISSA	MIPR	Utilities & NEC Support : Fort Hood, TX	4.945	-		0.026		-		-		-	0.000	4.971	-
ARL Matrix	MIPR	Test : Fort Hood, TX	6.374	-		-		-		-		-	0.000	6.374	-
In-House Support	Allot	Test : Fort Hood, TX	3.444	1.656		2.316		2.827		-		2.827	Continuing	Continuing	Continuing
Instrumentation	C/UCA	Test Equipment Infrastructure : Fort Hood, TX	3.029	0.155		0.222		0.100		-		0.100	Continuing	Continuing	Continuing
Subtotal			36.945	2.206		4.152		7.764		-		7.764	Continuing	Continuing	N/A

Remarks
ARL Matrix effort became a "reimbursable" effort under Open-the-Door cost model effective in FY17; no longer "Direct" funded. ISSA no longer funded at CTSF level.

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	71.844	2.517	4.918	8.816	-	8.816	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army							Date: February 2018			
Appropriation/Budget Activity			R-1 Program Element (Number/Name)		Project (Number/Name)					
2040 / 5			PE 0604818A / Army Tactical Command & Control Hardware & Software		C29 / Centralized Technical Support Facility (CTSF)					
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
<u>Remarks</u>										

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C29 / Centralized Technical Support Facility (CTSF)

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Software Block (SWB) 11/12 version 11-16 AIC Test Event		■																										
11-17 Army Interoperability Certification (AIC) Test Event				■																								
11-18 AIC Test Event								■																				
11-19 AIC Test Event												■																
11-20 AIC Test Event																■												
11-21 AIC Test Event																				■								
11-22 AIC Test Event																								■				
11-23 AIC Test Event																												■
11-24 AIC Test Event																												
11-25 AIC Test Event																												
11-26 AIC Test Event																												
11-27 AIC Test Event																												
11-28 AIC Test Event																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C29 / Centralized Technical Support Facility (CTSF)

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
11-29 AIC Test Event																													■			
Common Operating Environment (COE) v3.0 Interoperability & Integration Event																													■			
COE v3.0 AIC Test Event																													■			
COE v3.1 AIC Test Event																													■			
COE v3.2 AIC Test Event																													■			
COE v3.3 AIC Test Event																													■			
COE v3.4 AIC Test Event																													■			
COE v3.5 AIC Test Event																													■			
COE v3.6 AIC Test Event																													■			
Common Operating Environment (COE) v4.0 Interoperability & Integration Event																													■			
COE v4.1 AIC Test Event																													■			
COE v4.2 AIC Test Event																													■			
COE v4.3 AIC Test Event																													■			

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software		Project (Number/Name) C29 / Centralized Technical Support Facility (CTSF)	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Configuration Mangement (CM)	Configuration Management (continuous)																											
Engineering Services (ES) Test Engineering & Integration	Test Engineering & Integration (continuous)																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C29 / Centralized Technical Support Facility (CTSF)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Software Block (SWB) 11/12 version 11-16 AIC Test Event	2	2017	2	2017
11-17 Army Interoperability Certification (AIC) Test Event	4	2017	4	2017
11-18 AIC Test Event	1	2018	1	2018
11-19 AIC Test Event	2	2018	3	2018
11-20 AIC Test Event	3	2018	4	2018
11-21 AIC Test Event	4	2018	1	2019
11-22 AIC Test Event	1	2019	2	2019
11-23 AIC Test Event	3	2019	4	2019
11-24 AIC Test Event	1	2020	2	2020
11-25 AIC Test Event	3	2020	3	2020
11-26 AIC Test Event	4	2020	4	2020
11-27 AIC Test Event	1	2021	2	2021
11-28 AIC Test Event	3	2021	4	2021
11-29 AIC Test Event	2	2022	3	2022
Common Operating Environment (COE) v3.0 Interoperability & Integration Event	1	2018	3	2018
COE v3.0 AIC Test Event	4	2018	1	2019
COE v3.1 AIC Test Event	1	2019	2	2019
COE v3.2 AIC Test Event	3	2019	4	2019
COE v3.3 AIC Test Event	1	2020	1	2020
COE v3.4 AIC Test Event	2	2020	3	2020
COE v3.5 AIC Test Event	1	2021	1	2021
COE v3.6 AIC Test Event	2	2021	3	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	Project (Number/Name) C29 / <i>Centralized Technical Support Facility (CTSF)</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
Common Operating Environment (COE) v4.0 Interoperability & Integration Event	1	2021	3	2021
COE v4.1 AIC Test Event	4	2021	4	2021
COE v4.2 AIC Test Event	1	2022	2	2022
COE v4.3 AIC Test Event	3	2022	4	2022
Configuration Mangement (CM)	2	2007	4	2022
Engineering Services (ES) Test Engineering & Integration	2	2007	4	2022

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C34 / Army Tac C2 Sys Eng
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
C34: Army Tac C2 Sys Eng	-	8.654	7.767	9.394	-	9.394	9.483	9.716	9.985	11.706	0.000	66.705
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project C34, Army Tactical Command and Control Systems Engineering: This project funds the PEO Command, Control, Communications-Tactical (PEO C3T) Technical Management Division (TMD) System of Systems engineering and integration, experimentation, acquisition management, testing, fielding and sustainment support to ensure interoperability and affordability within the PEO C3T portfolio. The TMD focuses on System-of-Systems (SoS) Engineering and Integration for the C3T network with increased emphasis on immediate Warfighter needs as well as leveraging emerging technologies. Fiscal Year 2018 will focus on the continued development, implementation and integration of the Command, Control, Communications, Computers, Combat Systems, Intelligence, Surveillance, and Reconnaissance (C5ISR) network architectures. This will include development of a technology enhancement roadmap for SoS capability evolution across the PEO C3T portfolio; network integration support and design products for system validation through various integration testing; integration of tactical Networked capabilities for all Mission Command Network systems, initial fieldings, and integration events; integration of tactical information assurance solutions and security measures for consistent cyber protection; and execution of SoS developmental testing across the PEO portfolio in support of system fielding.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Continue Army Tactical Battle Command and Network Synchronization and Integration Support	0.133	0.120	0.145	-	0.145
Description: .					
FY 2018 Plans: Continue the support of current force and the development of future force C5ISR across the tactical network to ensure all Assistant Secretary of the Army (Acquisition, Logistics & Technology) (ASA(ALT)) programs are synchronized and redundancies and overlapping capabilities are reduced across the network and in synchronization with Common Operating Environment.					
FY 2019 Base Plans: Continue the support of current force and the development of future force C5ISR across the tactical network to ensure all Assistant Secretary of the Army (Acquisition, Logistics & Technology) (ASA(ALT)) programs are synchronized and redundancies and overlapping capabilities are reduced across the network and in synchronization with Common Operating Environment.					
FY 2018 to FY 2019 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C34 / Army Tac C2 Sys Eng			
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funding supports continued design work.					
<p>Title: Continue Developmental Test and Integration Test Support between Programs of Record (PORs) and platforms / Command Posts (CPs) to execute System-of-Systems (SoS) and Interoperability</p> <p>Description: .</p> <p>FY 2018 Plans: Design, configure and establish a system of systems integration test infrastructure architecture and implementation. Continue to provide the infrastructure and support in conducting integration testing and systems engineering for C3T non-program of record and program of record systems, products, technical insertions, and systems under evaluation to ensure integration of capabilities across the network. Establish FANS Accreditation in support of COE risk reduction testing. Design and coordination of integration testing across the Mission Command Network systems.</p> <p>FY 2019 Base Plans: Continue to mature/revise the design, configuration and establishment of the system of systems integration test infrastructure architecture and implementation. Continue to provide the infrastructure and support in conducting integration testing and systems engineering for C3T non-program of record and program of record systems, products, technical insertions, and systems under evaluation to ensure integration of capabilities across the network. Maintain the FANS Accreditation in support of COE risk reduction testing. Continue the design and coordination of integration testing across the Mission Command Network systems.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding supports continued development.</p>	1.296	1.163	1.406	-	1.406
<p>Title: Continue Tactical Network Engineering</p> <p>Description: .</p> <p>FY 2018 Plans: Develop effective engineering strategies to integrate tactical applications for use across the C3T enterprise network. Continue to perform network planning and integration activities across all cross-domain system-of-systems future capabilities and technologies.</p> <p>FY 2019 Base Plans:</p>	0.743	0.666	0.806	-	0.806

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)			
2040 / 5	PE 0604818A / Army Tactical Command & Control Hardware & Software	C34 / Army Tac C2 Sys Eng			
B. Accomplishments/Planned Programs (\$ in Millions)					
	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Develop effective engineering strategies to integrate tactical applications for use across the C3T enterprise network. Continue to perform network planning and integration activities across all cross-domain system-of-systems future capabilities and technologies. FY 2018 to FY 2019 Increase/Decrease Statement: Funding supports continued engineering.					
Title: Conduct and Support System Interoperability Engineering and Development of System-of-Systems (SoS) Architectural Products Description: . FY 2018 Plans: Within the PEO C3T portfolio, continue to assess Emerging Technologies, identify critical integrated test points, monitor developmental testing at integration points, develop architectural data processes and products, and facilitate the transition of Network capabilities to the warfighter. FY 2019 Base Plans: Within the PEO C3T portfolio, continue to assess Emerging Technologies, identify critical integrated test points, monitor developmental testing at integration points, develop architectural data processes and products, and facilitate the transition of Network capabilities to the warfighter. FY 2018 to FY 2019 Increase/Decrease Statement: Funding supports continued development efforts.	1.668	1.497	1.810	-	1.810
Title: Continue Development and Implementation of Tactical Information Assurance (IA) Description: . FY 2018 Plans: Implement ARCYBER, CIO/G6 and CYBERCOM guidance for execution of Information Assurance policies and procedures at the tactical level. Continue to document the current tactical IA network architecture with the goal of developing recommendations to eliminate inconsistencies/duplications, increasing the security posture, decreasing complexity of operations, and decreasing costs. Continue to plan and design security measures and IA requirements across the tactical network for future capabilities. FY 2019 Base Plans:	0.251	0.226	0.273	-	0.273

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C34 / Army Tac C2 Sys Eng			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Implement ARCYBER, CIO/G6 and CYBERCOM guidance for execution of Information Assurance policies and procedures at the tactical level. Continue to document the current tactical IA network architecture with the goal of developing recommendations to eliminate inconsistencies/duplications, increasing the security posture, decreasing complexity of operations, and decreasing costs. Continue to plan and design security measures and IA requirements across the tactical network for future capabilities. FY 2018 to FY 2019 Increase/Decrease Statement: Funding supports continuing development efforts.					
Title: Continue System of Systems Development Description: . FY 2018 Plans: Continue to effectively manage overall System-of-Systems Engineering, Enterprise, and Integration efforts for the PEO C3T portfolio of technology and capability enhancement programs. Conduct verification and provide technical expertise with respect to SoS capabilities planned to field in FY19. Conduct design and engineering activities culminating in a PDR and CDR for SoS capabilities planned to field in FY20. Conduct design and engineering activities culminating in requirement and functional reviews for SoS capabilities planned to field in FY21. FY 2019 Base Plans: Continue to effectively manage overall System-of-Systems Engineering, Enterprise, and Integration efforts for the PEO C3T portfolio of technology and capability enhancement programs. Continue to conduct SoS engineering design for capabilities planned to field in FY20, FY21 and FY22. . FY 2018 to FY 2019 Increase/Decrease Statement: Funding supports continued SoS development.	2.969	2.665	3.223	-	3.223
Title: System of Systems (SoS) Engineering and Integration Evolution of the Network Description: . FY 2018 Plans: Continue to implement cross PEO System of Systems Engineering and Integration processes, analysis and S&T coordination to ensure successful development Engineering and Testing of current and future systems. Continue	1.594	1.430	1.731	-	1.731

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software		Project (Number/Name) C34 / Army Tac C2 Sys Eng	
B. Accomplishments/Planned Programs (\$ in Millions)					
to develop streamlined processes to support ASA(ALT) SoSE&I and implement Value Engineering (VE) and Lean Six Sigma initiatives across all PEO C3T capabilities to include the Mission partner Environment.					
FY 2019 Base Plans: Continue to implement cross PEO System of Systems Engineering and Integration processes, analysis and S&T coordination to ensure successful development Engineering and Testing of current and future systems. Continue to develop streamlined processes to support ASA(ALT) SoSE&I and implement Value Engineering (VE) and Lean Six Sigma initiatives across all PEO C3T capabilities to include the Mission partner Environment.					
FY 2018 to FY 2019 Increase/Decrease Statement: Funding supports continuing SoS integration efforts.					
Accomplishments/Planned Programs Subtotals					
	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
	8.654	7.767	9.394	-	9.394
C. Other Program Funding Summary (\$ in Millions)					
N/A					
Remarks					
Not applicable for this item.					
D. Acquisition Strategy					
This project provides the technical and programmatic disciplines required for systems engineering and integration, experimentation, acquisition management, testing, interoperability, support to fielding and sustainment. It will focus on System-of-Systems (SoS) Systems Engineering and Integration for the tactical network with increased emphasis on immediate Warfighter needs as well as leveraging emerging technologies, through the G3 LandWarNet Capability Set Development and Integration. The Technical Management Division (TMD) will ensure that the Program Executive Office Command, Control, Communications-Tactical (PEO C3T) capability portfolio is effectively SoS engineered and integrated to meet the tactical Warfighter's evolving mission needs.					
E. Performance Metrics					
N/A					

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software				Project (Number/Name) C34 / Army Tac C2 Sys Eng							
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Emerging Technologies	SS/FP	CACI : Aberdeen Proving Ground, MD	21.092	-		-		-		-		-	0.000	21.092	-
Emerging Technologies	SS/FP	Southwest Research Installation : Aberdeen Proving Ground, MD	0.175	-		-		-		-		-	0.000	0.175	-
System Of System Engineering and Integration, Current and Strategic Initiatives	C/T&M	CSC Aberdeen Proving Ground /Fort Hood, TX : APG	57.690	-		-		-		-		-	0.000	57.690	-
System of System Engineering & Integration, Current & Strategic Initiative, Architecture Integration	Various	Bowhead (extension) : Aberdeen Proving Ground, MD	8.601	2.511	Feb 2017	2.254		0.989	Oct 2018	-		0.989	0.000	14.355	-
System of System Engineering & Integration, Current & Strategic Initiative, Architecture Integration	TBD	TBD (previously Bowhead. Bowhead PoP ends 12/2018) : APG MD	-	-		-		2.969	Dec 2018	-		2.969	Continuing	Continuing	Continuing
Architecture Integration	C/T&M	CSC : various	9.005	-		-		-		-		-	0.000	9.005	-
Systems Engineering Support	SS/FP	LOCKHEED MARTIN : Eatontown, NJ	7.799	-		-		-		-		-	0.000	7.799	-
Systems Engineering Support	C/CPFF	Northrop Grumman : Arlington, VA	5.282	-		-		-		-		-	0.000	5.282	-
Systems Engineering Support	C/CPFF	Various : tbd	3.068	0.364	Oct 2016	0.328		0.395	Oct 2018	-		0.395	Continuing	Continuing	Continuing
System of System Architectures, Engineering, and Integration	SS/FP	MITRE : Aberdeen Proving Ground, MD/ Eatontown, NJ	91.084	4.248	Sep 2016	3.812		4.611	Sep 2018	-		4.611	Continuing	Continuing	Continuing
Tactical Network Initialization	SS/FP	Future Skys Inc. : Neptune, NJ	0.600	-		-		-		-		-	0.000	0.600	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C34 / Army Tac C2 Sys Eng
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 of System Engineering and Integration	C/T&M	CSC : Huntsville, AL	0.183	-		-		-		-		-	0.000	0.183	-
System of System Engineering and Integration	C/T&M	Viatech : NJ	0.367	-		-		-		-		-	0.000	0.367	-
Subtotal			204.946	7.123		6.394		8.964		-		8.964	Continuing	Continuing	N/A

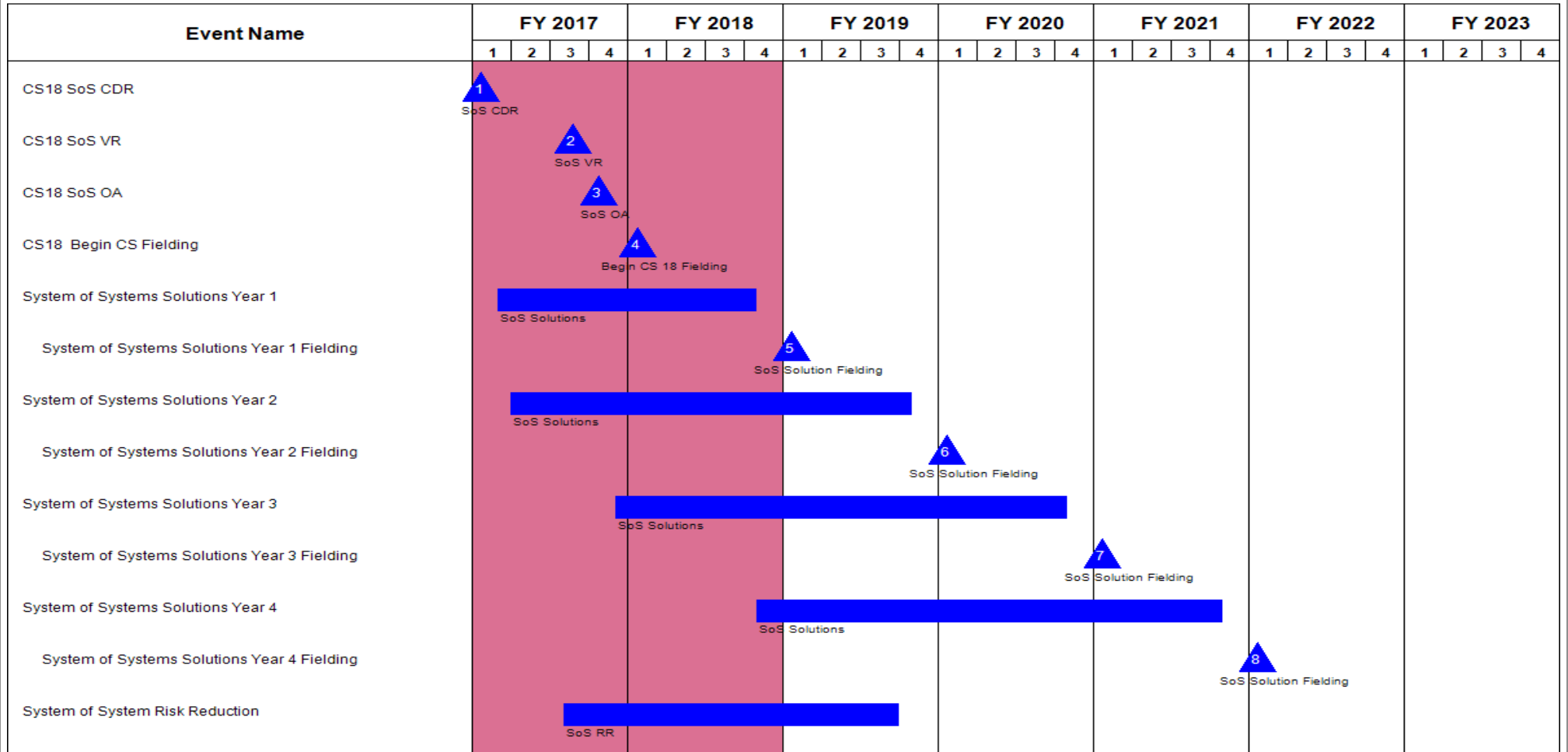
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
IN-HOUSE SUPPORT	Various	PEO C3T : APG, MD	31.629	1.101		0.987		-		-		-	0.000	33.717	-
MATRIX	Various	Various : Aberdeen Proving Ground, MD	12.802	0.430		0.386		0.430		-		0.430	Continuing	Continuing	Continuing
OTHER GOVERNMENT SUPPORT	Various	Various : Various	7.377	-		-		-		-		-	0.000	7.377	-
Subtotal			51.808	1.531		1.373		0.430		-		0.430	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals		256.754	8.654	7.767	9.394	-		9.394	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C34 / Army Tac C2 Sys Eng



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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C34 / Army Tac C2 Sys Eng

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
AIC SoS Risk Reduction	<div style="background-color: blue; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: blue; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: blue; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: blue; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: blue; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: blue; width: 100%; height: 15px; margin-bottom: 5px;"></div>				AIC SoS RR																							
Network Integration: Efficient/Robust Network					Network Integration: Efficient/Robust Network																							
Network Integration: Cyber Defense					Network Integration: Cyber Defense																							
Network Integration: Services					Network Integration: Services																							
Network Integration: Network Simplicity					Network Integration: Network Simplicity																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) C34 / Army Tac C2 Sys Eng

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CS18 SoS CDR	1	2017	1	2017
CS18 SoS VR	3	2017	3	2017
CS18 SoS OA	4	2017	4	2017
CS18 Begin CS Fielding	1	2018	1	2018
System of Systems Solutions Year 1	1	2017	4	2018
System of Systems Solutions Year 1 Fielding	1	2019	1	2019
System of Systems Solutions Year 2	1	2017	4	2019
System of Systems Solutions Year 2 Fielding	1	2020	1	2020
System of Systems Solutions Year 3	4	2017	4	2020
System of Systems Solutions Year 3 Fielding	1	2021	1	2021
System of Systems Solutions Year 4	4	2018	4	2021
System of Systems Solutions Year 4 Fielding	1	2022	1	2022
System of System Risk Reduction	3	2017	3	2019
AIC SoS Risk Reduction	1	2017	2	2021
Network Integration: Efficient/Robust Network	1	2017	3	2021
Network Integration: Cyber Defense	1	2017	3	2021
Network Integration: Services	1	2017	3	2021
Network Integration: Network Simplicity	1	2017	3	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software				Project (Number/Name) EJ4 / COMMAND POST COMPUTING ENVIRONMENT (CPCE)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EJ4: COMMAND POST COMPUTING ENVIRONMENT (CPCE)	-	90.254	61.576	35.018	-	35.018	20.650	1.805	1.843	1.881	0.000	213.027
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The goal of the Command Post Computing Environment (CPCE), one of the six computing environments under the Army's Common Operating Environment (COE) initiative, is to eliminate "stove-piped" legacy systems and provide an integrated, interoperable, cyber-secure, cost-effective computing infrastructure framework to serve as the basis for multiple warfighting functions. CPCE will provide Programs of Record a core infrastructure, including a common operating picture (COP) tool, common data strategy, common applications, common hardware configurations, and common look and feel (user interface) that allows rapid development of future capabilities within that construct. This effort eliminates duplicative or redundant implementations, simplifies future development efforts, and enhances interoperability and data sharing across multiple echelons. Acquisition Goals of the CPCE include: Acquisition Agility, Open System Architectures, Reduced Life Cycle Costs, and a Cyber-Hardened Foundation for applications and services.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: System Requirements Engineering	7.789	3.000	3.241	-	3.241
Description: Requirements analysis of multiple Joint Capabilities Integration Development System (JCIDS) documents and other sources to determine Minimal Essential Capabilities (MECs) and full capability requirements for CPCE. Requirements configuration management and adjudication, and overall management and conduct of the Requirements Configuration Control Board (CCB) process. Translation of requirements into lower-level (L2, L3) subrequirements and development of a System / Subsystem Specification (SSS), and multiple system requirements specifications (SRS).					
FY 2018 Plans: For FY18, will continue to ingest infrastructure requirements for incorporation into later versions of CPCE software. Will assist Programs of Record with determining overlapping requirements that are already satisfied by the CPCE core utilities. Maintain the MC SSS Requirements Verification Traceability Matrix (RVTM) and SSS/SRS.					
FY 2019 Base Plans: For FY19, will continue to ingest infrastructure requirements for incorporation into later versions of CPCE software. Will continue to refine a formal governance process for the incorporation of additional Program of					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ4 / COMMAND POST COMPUTING ENVIRONMENT (CPCE)			
B. Accomplishments/Planned Programs (\$ in Millions)					
Record (POR) functionality. Assist Programs of Record with determining overlapping requirements that are already satisfied by the CPCE core utilities. Maintain the MC SSS Requirements Verification Traceability Matrix (RVTM) and SSS/SRS.					
FY 2018 to FY 2019 Increase/Decrease Statement:					
No significant change in this category, as systems requirements engineering is a somewhat stable level of effort in the CPCE program.					
Title: SW Dev - Core Infrastructure					
Description: Provides an integrated mission command capability across Command Post and Platforms, through all echelons, that provides simplicity, intuitiveness, core services and applications, common look and feel, and warfighter functionality in the areas of Fires, Logistics, Intelligence, Airspace Management and Maneuver. Primary software development efforts include development of a simple Common Operating Picture (COP), a Common Geospatial solution (map), a user interface with "common Look and Feel", and common Data Services, including an extensible database and data persistence. Software development efforts focus on designing the system to reduce the training burden on the Soldier, and the creation of an Integrated Software Development Kit (ISDK) that allows external Programs of Record the ability to integrate new capabilities without rebuilding common components.					
FY 2018 Plans:					
Continue integration of the CPCE v3 COTS underlying infrastructure, Core Utilities, backwards compatibility, and Warfighter Function (WfF) Applications into a holistic System of Systems and ensuring that those subsystems function together in accordance to Program requirements and specifications. These responsibilities include software engineering and development of DevOps, test engineering, and release management, Command, Control and Intelligence (C2I) Ultra Light, Open Routing, Data Flows, Hybrid Operating System, Extensible Map Platform (EMP) Renderer, Map Based Planning, Joint and Coalition Interoperability, and Tactical Server Infrastructure.					
FY 2019 Base Plans:					
Continue the final integration of the CPCE v3 COTS underlying infrastructure, Core Utilities, backwards compatibility, and Warfighter Function (WfF) Applications into a holistic System of Systems and ensuring that those subsystems function together in accordance to Program requirements and specifications. These responsibilities include software engineering and development of DevOps, test engineering, and release management, Command, Control and Intelligence (C2I) Ultra Light, Open Routing, Data Flows, Extensible					
	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
	64.570	33.606	19.127	-	19.127

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ4 / COMMAND POST COMPUTING ENVIRONMENT (CPCE)				
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Map Platform (EMP) Renderer, Map Based Planning, Joint and Coalition Interoperability, and Tactical Server Infrastructure.						
FY 2018 to FY 2019 Increase/Decrease Statement: Software development effort in support of CPCE V3.0 will be completed in FY19.						
Title: Hardware/Software Integration		4.728	4.800	4.050	-	4.050
Description: Hardware / Software Integration within the Command Post Computing Environment consists of research, development, and engineering efforts required to select, engineer, and field a Commercial off the Shelf hardware server and related components. The CPCE software will reside on converged Tactical Server Infrastructure (TSI) v2 server stacks, which host multiple software infrastructure components including Microsoft Exchange, SharePoint, Defensive Cyber Operations (DCO) tools, SQL databases, Active Directory, and others. This enterprise software is tightly-coupled with, and engineered for, specific TSI hardware using virtual machine (VM) technology and must serve as the basis for all other warfighting functions and mission command system software loaded on the server.						
FY 2018 Plans: For FY18, primary effort includes continued development of VM structure of the TSI server architecture to incorporate more processing power and functionality in a reduced footprint. Potential switch from current VM vendor product to a different vendor hypervisor product, to save cost, will be investigated. Ongoing efforts to migrate Program of Record functionality to the CPCE will require TSI server stack accommodations and reengineering.						
FY 2019 Base Plans: For FY19, primary effort includes continued development of VM structure of the TSI server architecture to incorporate more processing power and functionality in a reduced footprint. Ongoing efforts to migrate Program of Record functionality to the CPCE will require TSI server stack accommodations and reengineering. This engineering includes server deployment script automation.						
FY 2018 to FY 2019 Increase/Decrease Statement: The majority Hardware/Software integration requirements and costs will be recognized in FY18. In FY19, engineering continues on the TSI Server, however previous versions will transition to sustainment, allowing the hardware team to focus on future consolidation, deployment, and utilization improvements.						
Title: Joint & Coalition Interoperability		0.100	0.250	1.250	-	1.250

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ4 / COMMAND POST COMPUTING ENVIRONMENT (CPCE)

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: Consists of efforts in support of Joint Interoperability and Coalition Partner Interoperability. (One of the goals of CPCE v3 is to improve the sharing of mission command capabilities among the US Armed Services and our Coalition partners in the Mission Partner Environment (MPE).)</p> <p>FY 2018 Plans: CPCE Joint and Coalition Interoperability plans for FY18 include continued participation in the PM-CEWG and SSG-A events. In addition, CPCE will provide Defense Information Systems Agency (DISA) with engineering requirements for integration and interfaces with the Global Command and Control System - Joint Enterprise (GCCS-JE) and specific requirements for Disconnected, Intermittent, or Limited (DIL) communications in a Denied Operational Environment. This effort will support the DISA's mission to release an RFP for the Global Command and Control System - Joint Enterprise (GCCS-JE) in FY18.</p> <p>FY 2019 Base Plans: CPCE Joint and Coalition Interoperability plans for FY19 include continued participation in the Program Manager-Computing Environment Working Group (PM-CEWG) and Senior Steering Group-Acquisition (SSG-A) events. In addition, CPCE will provide Defense Information Systems Agency (DISA) with engineering requirements for integration and interfaces with the Global Command and Control System - Joint Enterprise (GCCS-JE) and specific requirements for Disconnected, Intermittent, or Limited (DIL) communications in a Denied Operational Environment. This effort will support the DISA's mission to execute contract award for the Global Command and Control System - Joint Enterprise (GCCS-JE) in FY19.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: The increase in funding of Joint and Coalition efforts reflects increased manpower to support CPCE to GCCS-JE linkage and Joint Planning Service (JPS).</p>					
<p>Title: Test and Evaluation</p> <p>Description: Test and evaluation efforts include the planning and conduct of Command Post Computing Environment (CPCE) / Mounted Computing Environment (MCE) T&E events including Developmental Test, Software Acceptance Testing, Integration Events, Risk Reduction Events, and Initial Operational Test and Evaluation (IOT&E).</p> <p>FY 2018 Plans: In FY18, Efforts are being done in coordination with MCE. CPCE/MCE will finalize planning and conduct the formal Initial Operational Test & Evaluation (IOTE) event. Leading up to IOTE, CPCE/MCE will conduct multiple</p>	4.619	9.920	2.350	-	2.350

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ4 / COMMAND POST COMPUTING ENVIRONMENT (CPCE)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Operational Test Readiness Reviews (OTRRs) and Lab-Based Risk Reduction events (LBRRs). Following OT, CPCE/MCE will participate in Army Interoperability Certification (AIC) testing for certification of IERs via Army Mission Threads. FY 2019 Base Plans: In FY19, CPCE/MCE will participate in formal Initial Operational Test & Evaluation (IOTE) after action reviews and adjudicate findings and observations from the formal test. Following IOTE, CPCE/MCE will participate in Army Interoperability Certification (AIC) testing for certification of IERs via Army Mission Threads. FY 2018 to FY 2019 Increase/Decrease Statement: Scope of testing decreased from FY18 to FY19.					
Title: Program Management Description: Program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning meetings and IPTs. FY 2018 Plans: Provide overall management and oversight of the implementation of CPCE. Technical Area support of this effort includes System Development and engineering changes to hardware, software, and network), System Analysis of Program of Record (PoR) systems and future systems, Technical Readiness Assessments, and Stakeholder Technical Interchange Meetings/Events. This support includes the creation and implementation of Functional Support Agreements between PM Mission Command and various Government support agencies such as the Army Research and Development Center (ARDEC) CECOM Research Development and Engineering Command (CERDEC), and other PEOs (e.g. PEO IEW&S). Program Management efforts in the FY18 timeframe will also include business area support to ensure funding and contracts are planned and available for all SW development, system engineering, and T&E efforts. FY 2019 Base Plans: Management and oversight funding for government support to be transitioned to OMA funding. Technical Area Contract support will continue for this effort which includes System Development and engineering changes to hardware, software, and network), System Analysis of Program of Record (PoR) systems and future systems, Technical Readiness Assessments, and Stakeholder Technical Interchange Meetings/Events. This support includes the creation and implementation of Functional Support Agreements between PM Mission Command and various Government support agencies such as the Army Research and Development Center (ARDEC)	8.448	8.500	3.500	-	3.500

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ4 / COMMAND POST COMPUTING ENVIRONMENT (CPCE)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
CECOM Research Development and Engineering Command (CERDEC), and other PEOs (e.g. PEO IEW&S). Program Management efforts in the FY19 timeframe will also include business area support to ensure funding and contracts are planned and available for all SW development, system engineering, and T&E efforts. FY 2018 to FY 2019 Increase/Decrease Statement: Funding for Core and Matrix Labor (management and oversight of CPCE) transitioned to OMA appropriation in FY19. Contract Technical support will remain.					
Title: Product Support Description: Product Support includes all efforts related to type classification, materiel release, provisioning, life cycle sustainment strategies, training development, and total package fielding. FY 2018 Plans: In FY18, CPCE will prepare training packages, continue efforts to define Basis of Issue Plan (BOIP), prepare for a logistics demonstration to verify and validate Technical Data Products and the formal Life Cycle Sustainment Plan (LCSP). FY 2019 Base Plans: In FY19, CPCE will conduct a logistics demonstration to verify and validate Technical Data Products and complete the formal Life Cycle Sustainment Plan (LCSP), oversee all aspects of total package fielding, common new equipment training and delivery of the final system to the First Unit Equipped (FUE).	-	1.500	1.500	-	1.500
Accomplishments/Planned Programs Subtotals	90.254	61.576	35.018	-	35.018

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

Remarks

D. Acquisition Strategy
CPCE is not a Program of Record (PoR).

CPCE is being developed over time, with the initial set of v3 Minimum Essential Capabilities (MECs) being delivered in 4QFY19. Subsequent deliveries of capabilities are expected on a 5 year cycle (FY22, FY25, FY28), in accordance with the draft COE Information Systems Initial Capability Document (IS ICD). This cycle may be adjusted depending on many factors, including fielding priorities, effectiveness of backwards compatibility, and time required to develop and test new capabilities. The CPCE is a capability integration effort, based on a Commercial-Off-The-Shelf / Non-Developmental Item (COTS/NDI) software infrastructure package that allows

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	Project (Number/Name) EJ4 / <i>COMMAND POST COMPUTING ENVIRONMENT (CPCE)</i>
<p>for immediate third party development of warfighting capability applications in support of integrated Command Post, Mounted and Dismounted tactical computing capabilities.</p> <p>Efforts are being accomplished through a Commercial-of-the-Shelf/based product that will provide the infrastructure foundation, along with a mixture of organic Government and industry partners whose services will enhance the capabilities to meet DoD requirements and security standards. Government partners to include the U.S. Army Armament Research, Development and Engineering Center (ARDEC) Weapons Software Engineering Center (WSEC), Communications-Electronics Command (CECOM) Software Engineering Center (SEC), Aviation and Missiles Research and Development Center (AMRDEC) Software Engineering Directorate (SED) and Communications-Electronics Research, Development and Engineering Center (CERDEC). Commercial suppliers are assigned efforts through GSA Mission Command Engineering Services vehicles and Multiple Award Task Order (MATO) contracts. Hardware, core software and associated licenses to support converged system architecture is Commercial-off-the-Shelf (COTS) and procured through existing vehicles from GSA, Common Hardware Systems (CHS) and the Army Computer Hardware Enterprise Software and Solutions (CHESS).</p> <p><u>E. Performance Metrics</u> N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ4 / COMMAND POST COMPUTING ENVIRONMENT (CPCE)
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support (Gov't-Core)	Sub Allot	PM Mission Command : APG, MD	2.500	2.250	Oct 2016	2.250		-		-		-	0.000	7.000	-
PM Support (Gov't-Matrix)	IA	Various Matrix Orgs incl CECOM SEC, LRC, G8, G2, PRD, et al) : APG, MD	2.679	1.400	Oct 2016	1.400		-		-		-	0.000	5.479	-
PM Support (SETA Contractor)	C/FFP	Multiple incl CSRA and others : APG, MD	3.000	4.798	Dec 2016	4.850		3.500	Nov 2018	-		3.500	0.000	16.148	-
Subtotal			8.179	8.448		8.500		3.500		-		3.500	0.000	28.627	N/A

Remarks
Funding for Matrix (Management and Oversight of CPCE) transitions to OMA Appropriation in FY19.

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Requirements Engineering	Various	SW Dev Contractors and Multiple Matrix Orgs : Various Locations	10.841	7.789	Dec 2016	3.000		3.241	Oct 2018	-		3.241	0.000	24.871	-
Software Development - Core Infrastructure	Option/ Various	ARDEC, CERDEC, Systematic : Picatinny, NJ APG, MD Centerville, VA	41.508	64.570	Dec 2016	33.606		19.127	Oct 2018	-		19.127	0.000	158.811	-
Joint and Coalition Interoperability	Various	TBD : Various	0.126	0.100	Nov 2016	0.250		1.250	Nov 2018	-		1.250	0.000	1.726	-
Hardware / Software Integration	Various	multiple : APG Md	4.920	4.728	Feb 2017	4.800		4.050	Oct 2018	-		4.050	0.000	18.498	-
Subtotal			57.395	77.187		41.656		27.668		-		27.668	0.000	203.906	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ4 / COMMAND POST COMPUTING ENVIRONMENT (CPCE)
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			

Remarks
Software Development efforts will be managed through a combination of COTS Procurement, PM Mission Command technical staff, Matrix Organizations (CERDEC, AMRDEC) and software development contractor firms (contracts and task orders to be determined and competed as necessary).

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Product Support	C/FFP	SCCI : Austin, TX	-	-		1.500		1.500	Jun 2019	-		1.500	0.000	3.000	-
Subtotal			-	-		1.500		1.500		-		1.500	0.000	3.000	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Develop and Conduct Tests and Assessments	MIPR	Multiple Test Agencies : Multiple Locations (Primary APG)	2.116	4.619	Dec 2016	9.920		2.350	Oct 2018	-		2.350	0.000	19.005	-
Subtotal			2.116	4.619		9.920		2.350		-		2.350	0.000	19.005	N/A

			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			67.690	90.254		61.576		35.018		-		35.018	0.000	254.538	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ4 / COMMAND POST COMPUTING ENVIRONMENT (CPCE)

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CPCE V3 Arch, System Engr & Dev	[Redacted]																											
CPCE V3 SE & Dev	[Redacted]																											
CPCE V3 Test & Integration	[Redacted]																											
CPCE V3 Dev Test Events	[Redacted]																											
CPCE V3 IOTE	[Redacted]																											
Fielding Decision	[Redacted]																											
First Unit Equipped	[Redacted]																											
Logistics Demonstration	[Redacted]																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	Project (Number/Name) EJ4 / <i>COMMAND POST COMPUTING ENVIRONMENT (CPCE)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CPCE V3 Arch, System Engr & Dev	1	2017	4	2022
CPCE V3 Test & Integration	3	2017	1	2019
CPCE V3 IOTE	4	2018	4	2018
Fielding Decision	4	2019	4	2019
First Unit Equipped	4	2019	4	2019
Logistics Demonstration	1	2019	1	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software				Project (Number/Name) EJ5 / MOUNTED COMPUTING ENVIRONMENT (MCE)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EJ5: MOUNTED COMPUTING ENVIRONMENT (MCE)	-	16.202	16.949	19.190	-	19.190	8.200	0.000	0.000	0.000	0.000	60.541
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The MCE is one of the six computing environments (CEs) formalized by the AAE under the Common Operating Environment (COE) initiative. MCE standardizes end-user environments and enables streamlined deployment of new warfighting applications while leveraging existing hardware under the Joint Battle Command - Platform program. Requirements for the MCE are established in the draft Mounted Computing Environment Information System Initial Capabilities Document (MCE IS CDD). FY2018 funding provides the means to continue to manage and develop MCE in concert with CPCE.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Software Development	4.008	4.125	5.930	-	5.930
Description: Provides an integrated mission command capability across Platforms, through all echelons, that provides simplicity, intuitiveness, core services and applications, common look and feel, and warfighter functionality in the areas of Fires, Logistics, Intelligence, and Maneuver. Primary software development efforts include development of S/A functions and MC applications on a Common Geospatial solution [map], a user interface with "common look and feel", and common Data Services.					
FY 2018 Plans: Focus is on integrating existing capability and enabling new capability development in preparation for 4QFY19 fielding of the COE. These responsibilities include continued development of software architecture in conjunction with CPCE, Hybrid Operating System, test engineering, Map Based Planning, and Joint and Coalition Interoperability.					
FY 2019 Base Plans: Focus is on integrating existing capability and enabling new capability development in preparation for 4QFY19 fielding of the COE. These responsibilities include continued development of software architecture in conjunction with CPCE, foundational infrastructure, test engineering, Map Based Planning, and Joint and Coalition Interoperability.					
FY 2018 to FY 2019 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ5 / MOUNTED COMPUTING ENVIRONMENT (MCE)			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Efforts continue to support software development requirements.					
<p>Title: Software/Systems Engineering</p> <p>Description: Perform Software/Systems Engineering in support of the development of MCE capabilities, applications, and services, to include, but not limited to, conducting engineering studies, software architecture development, system analyses, technical readiness assessments, technical interchange meetings/events, and development of related reports and other deliverables. Coordinate the development of common infrastructure components with the CPCE.</p> <p>FY 2018 Plans: Development of software architecture constructs to sustain and integrate existing capability and enable new capability development. System engineering expertise in support of COE baselines, focusing on hardware/software integration, engineering, and development of common services across platforms. Includes planning and engineering of future MCE capabilities using COTS, i.e.: Common Authentication; performance characterization on different HW/SW configurations using Mounted Family of Computer Systems (MFoCS); and coordination of interoperability between external CEs.</p> <p>Continue design efforts, to include integration and lab based developmental and system of systems testing, specifically, GPS updates for platform, platform/sensor integration for platform, Risk Management Framework (RMF)/Information Assurance (IA) certification, C2IUL integration, wireless integration into platform, and the Hybrid Operating System.</p> <p>FY 2019 Base Plans: Development of software architecture constructs to sustain and integrate existing capability and enable new capability development. System engineering expertise in support of COE baselines, focusing on hardware/software integration, engineering, and development of common services across platforms. Includes planning and engineering of future MCE capabilities using COTS, i.e.: Common Authentication; performance characterization on different HW/SW configurations using Mounted Family of Computer Systems (MFoCS); and coordination of interoperability between external CEs.</p> <p>Continue design efforts, to include integration and lab based developmental and system of systems testing, specifically, GPS updates for platform, platform/sensor integration for platform, Risk Management Framework</p>	10.322	7.624	11.040	-	11.040

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ5 / MOUNTED COMPUTING ENVIRONMENT (MCE)			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
(RMF)/Information Assurance (IA) certification, C2IUL integration, wireless integration into platform, and the Hybrid Operating System. FY 2018 to FY 2019 Increase/Decrease Statement: Funding supports planned systems engineering requirements.					
Title: Test and Evaluation Description: Test and evaluation efforts include the planning and conduct of combined Command Post/Mounted Computing Environment T&E events including Developmental Test, Software Acceptance Testing, Integration Events, Risk Reduction Events, and Initial Operational Test and Evaluation (IOT&E). FY 2018 Plans: In FY18, Efforts are being done in coordination with CPCE. CPCE/MCE will finalize planning and conduct the formal Initial Operational Test & Evaluation (IOTE) event. Leading up to IOTE, CPCE/MCE will conduct multiple Operational Test Readiness Reviews (OTRRs) and Lab-Based Risk Reduction events (LBRRs). Following OT, CPCE/MCE will participate in Army Interoperability Certification (AIC) testing for certification of IERs via Army Mission Threads. FY 2019 Base Plans: In FY19, MCE will participate in formal Initial Operational Test & Evaluation (IOTE) after action reviews and adjudicate findings and observations from the formal test. Following IOTE, MCE will participate in Army Interoperability Certification (AIC) testing for certification of IERs via Army Mission Threads. FY 2018 to FY 2019 Increase/Decrease Statement: Scope of testing decreased from FY18 to FY19.	0.604	4.000	1.000	-	1.000
Title: Program Management Description: Program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning meetings and Integrated Project Teams. FY 2018 Plans: Will continue to provide overall management and oversight of the implementation of MCE. This support includes the creation and implementation of Functional Support Agreements between PM Mission Command and various Government support agencies such as the CERDEC, and other PEOs, (e.g. PEO Soldier). Program	1.268	1.200	1.220	-	1.220

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ5 / MOUNTED COMPUTING ENVIRONMENT (MCE)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Management efforts in the FY18 timeframe will also include business area support to ensure funding and contracts are planned and available for all SW development, system engineering, and T&E efforts.</p> <p>FY 2019 Base Plans: Management and oversight funding to be transitioned to OMA funding. Technical Area support of this effort includes System Development and engineering changes to hardware, software, and network), System Analysis of Program of Record (PoR) systems and future systems, Technical Readiness Assessments, and Stakeholder Technical Interchange Meetings/Events. This support includes the creation and implementation of Functional Support Agreements between PM Mission Command and various Government support agencies such as the Army Research and Development Center (ARDEC) CECOM Research Development and Engineering Command (CERDEC), and other PEOs (e.g. PEO IEW&S). Program Management efforts in the FY19 timeframe will also include business area support to ensure funding and contracts are planned and available for all SW development, system engineering, and T&E efforts.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding for Core and Matrix Labor (management and oversight of CPCE) transitioned to OMA appropriation in FY19.</p>					
Accomplishments/Planned Programs Subtotals	16.202	16.949	19.190	-	19.190

<p>C. Other Program Funding Summary (\$ in Millions) N/A</p> <p>Remarks N/A</p> <p>D. Acquisition Strategy MCE is not a Program of Record (PoR).</p> <p>MCE is being developed over time, with the initial set of v3 Minimum Essential Capabilities (MECs) being delivered in 4QFY19. Subsequent deliveries of capabilities are expected on a 5 year cycle (FY22, FY25, FY28), in accordance with the draft COE Information Systems Initial Capability Document (IS ICD). This cycle may be adjusted depending on many factors, including fielding priorities, effectiveness of backwards compatibility, and time required to develop and test new capabilities.</p> <p>To accomplish the goals of the MCE, PEO C3T PM MC architects, designs, and develops the hardware, software, network solutions and capabilities required to achieve compliance with the COE. Primary systems architecture engineering is conducted by in-house Government engineering staff with support from CACI/Agile</p>
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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army Date: February 2018

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
2040 / 5	PE 0604818A / Army Tactical Command & Control Hardware & Software	EJ5 / MOUNTED COMPUTING ENVIRONMENT (MCE)

matrix elements and MITRE Corp, a Fully Funded Research and Development Centers. Test and Evaluation support is provided by in-house PM MC TMD staff, with support from contractor firms, for preparation and conduct of specific risk reduction events and test events. Developmental testing is being conducted by the software development teams with Government oversight and coordination. Hardware to support system architecture and software development is comprised of standardized equipment and is procured using existing contract vehicles such as Mounted Family of Computer Systems (MFoCS).

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604818A / Army Tactical Command & Control Hardware & Software				EJ5 / MOUNTED COMPUTING ENVIRONMENT (MCE)							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PM Support(Mixed support: Gov't-Core and Matrix; SETA Contractor)	Various	PM Mission Command : Aberdeen Proving Ground, MD	1.084	1.268		1.200		1.220		-		1.220	Continuing	Continuing	-
Subtotal			1.084	1.268		1.200		1.220		-		1.220	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	Various	PM Mission Cmd, Multiple Matrix Orgs and SW Dev Contractors : Aberdeen Proving Ground, MD	3.711	4.008		4.125		5.930		-		5.930	Continuing	Continuing	-
Software/Systems Engineering	Various	PM Mission Cmd, Multiple Matrix Orgs and SW Dev Contractors : Aberdeen Proving Ground, MD	4.701	10.322		7.624		11.040		-		11.040	Continuing	Continuing	-
Subtotal			8.412	14.330		11.749		16.970		-		16.970	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test, Evaluation and Integration	MIPR	Multiple Test Agencies; Multiple Locations : Aberdeen Proving Ground, MD	2.474	0.604		4.000		1.000		-		1.000	Continuing	Continuing	-
Subtotal			2.474	0.604		4.000		1.000		-		1.000	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 5			R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software				Project (Number/Name) EJ5 / MOUNTED COMPUTING ENVIRONMENT (MCE)				
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	11.970	16.202	16.949	19.190	-	19.190	Continuing	Continuing	N/A		

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ5 / MOUNTED COMPUTING ENVIRONMENT (MCE)

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MCE V3 Arch, System Engr & Dev																												
MCE V3 SE & Dev																												
MCE V3 Test & Integration																												
MCE V3 Dev Test Events																												
MCE V3 IOTE																												
MCE V3 IOTE																												
Fielding Decision																												
Fielding Decision																												
First Unit Equipped																												
First Unit Equipped																												
Logistics Demonstration																												
Logistics Demonstration																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	Project (Number/Name) EJ5 / <i>MOUNTED COMPUTING ENVIRONMENT (MCE)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MCE V3 Arch, System Engr & Dev	1	2018	4	2022
MCE V3 Test & Integration	3	2017	1	2019
MCE V3 IOTE	4	2018	4	2018
Fielding Decision	3	2019	3	2019
First Unit Equipped	4	2019	4	2019
Logistics Demonstration	1	2019	1	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software					Project (Number/Name) EJ6 / TACTICAL ENHANCEMENT		
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EJ6: TACTICAL ENHANCEMENT	-	12.907	0.000	17.873	-	17.873	11.862	9.884	0.000	0.000	0.000	52.526
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Tactical Enhancement supports the evaluation and testing requirements for Terrestrial Transmission (TRILOS) and Troposcatter Transmission (TROPO) capabilities procured and fielded under the Signal Modernization (SIGMOD) funding line, B00010. TRILOS and TROPO will provide redundancy communications in a Satellite denied environment by providing improved Line of Site and beyond line of sight radio systems. In addition this funding will support development of Network Centric Waveform-Resilient (NCW-R). NCW-R is a critical, near-term set of modifications to the current WIN-T SATCOM waveform that will provide limited protection against our adversaries' ability to jam tactical SATCOM Command and control communications on Wideband Global SATCOM (WGS) satellites. NCW-R will provide anti-jam capability and resiliency to WIN-T Program of Record satellite terminals in contested environments. The NCW-R waveform software will operate on currently fielded WIN-T satellite modems as well as those planned to be fielded for tech refresh in the near term. NCW-R will provide a bridging capability until the next generation protected satellite constellation is launched by the Air Force (projected FY28/29). The current anti-jam protection is limited to two SMART-T terminals per BCT, division and Corps HQs, leaving battalions vulnerable to being isolated during jamming events. FY19 funding begins the Army's concentrated effort for near term satellite anti-jam protection.

SIGMOD Capabilities:

TRILOS: Enables Mission Command in a Satellite Denied environment at higher throughput than the current High Capacity Line of Sight System (HCLOS). TRILOS will enable Army units to reduce reliance on costly satellite bandwidth. TRILOS will extend the network by utilizing a significantly reduced Size, Weight and Power (SWaP) radio verses the aging HCLOS system.

TROPO: Enables Mission Command in a Satellite Denied environment by providing Beyond Line of Site (BLOS) capability over longer ranges and at higher throughput than the current BLOS System. TROPO extends the network by utilizing a significantly reduced SWaP radio verses the current system. TROPO will enable Army units to reduce reliance on costly satellite bandwidth.

No FY18 funding: Testing requirements for TROPO moved from FY18 to FY19 due to a delay in requirements definition and availability of COTS products to meet the requirement.

FY19 funds support TROPO test requirement and NCW-R future development and developmental testing effort.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: IOT&E for TRILOS systems	11.407	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ6 / TACTICAL ENHANCEMENT

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: IOT&E for terrestrial communications TRILOS Systems					
Title: IOT&E for TROPO systems	-	-	8.600	-	8.600
FY 2019 Base Plans: FY19 \$8.6M are needed for TROPO IOT&E testing					
FY 2018 to FY 2019 Increase/Decrease Statement: No FY18 funds. FY19 funds are for TROPO test					
Title: Development of NCW-R	1.500	-	9.273	-	9.273
FY 2019 Base Plans: \$9.273M are needed for NCW-R development. NCW-R is an improvement of the NCW waveform and provides a bridging Protected SATCOM capability for Army tactical formations until the Army and Air Force deploy the Protected Tactical Waveform (PTW) and its associated Infrastructure.					
FY 2018 to FY 2019 Increase/Decrease Statement: No FY18 funds. Funds in FY19 are for NCW-R					
Accomplishments/Planned Programs Subtotals	12.907	-	17.873	-	17.873

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• B00010: <i>Signal Modernization</i>	58.250	97.618	150.777	-	150.777	127.867	139.682	147.278	176.801	0.000	898.273

Remarks

B00010 : OPA funding line for Signal Modernization (SIGMOD)

D. Acquisition Strategy

These funds will be used to conduct System Evaluation and Formal Testing of the various Signal Mod capabilities, specifically the TROPO and Terrestrial Transmission (TRILOS) systems. This is in order to facilitate integration into the WIN-T tactical ground networks. Testing and evaluation efforts will leverage the Network Integration Evaluation (NIE) events, specifically NIE 17.2 (TRILOS) events. TROPO test is anticipated in 3QFY19. These test events will meet all mandatory testing requirements with full ATEC oversight. This Acquisition Strategy will integrate proven Commercial-Off-The-Shelf (COTS) capabilities into existing WIN-T nodes to expand and enhance network capacity and user access. The TROPO and TRILOS capabilities will be acquired as ACAT III programs to replace legacy equipment in the field while utilizing DoDI 5000.02 standard acquisition approaches, starting with Milestone C Determination for TRILOS (3QFY17) and TROPO (2QFY18). The Army will continue

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	Project (Number/Name) EJ6 / <i>TACTICAL ENHANCEMENT</i>
NCW-R development in FY19 and conduct developmental testing in 4th quarter FY19, followed by certification for operational use over Wideband Global SATCOM (WGS) satellites by Army Space and Missile Defense Command. The Army projects to begin fielding this improved, resilient satellite communication waveform in 4th Quarter FY20.		
E. Performance Metrics N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ6 / TACTICAL ENHANCEMENT
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
NCW-R	Option/CPFF	CODES1403AALION SCIENCE AND TECHNOLOGY CORPORATION : 202BURR RIDGE IL 60527-0849FACILITY	-	1.500	Apr 2017	-		9.273	Jan 2019	-		9.273	0.000	10.773	-
Subtotal			-	1.500		-		9.273		-		9.273	0.000	10.773	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
N/A	Option/CPFF	CODES1403AALION SCIENCE AND TECHNOLOGY CORPORATION : 202BURR RIDGE IL 60527-0849FACILITY	-	-		-		0.000		-		0.000	-	-	-
Subtotal			-	-		-		0.000		-		0.000	-	-	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
TRILOS Testing	MIPR	A TEC : Aberdeen Proving Ground, MD	8.416	11.407	May 2017	-		-		-		-	0.000	19.823	-
TROPO Testing	MIPR	A TEC : Aberdeen Proving Ground, MD	-	-		-		8.600	May 2019	-		8.600	0.000	8.600	-
Subtotal			8.416	11.407		-		8.600		-		8.600	0.000	28.423	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army								Date: February 2018			
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software				Project (Number/Name) EJ6 / TACTICAL ENHANCEMENT			
	Prior Years	FY 2017		FY 2018		FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	8.416	12.907		0.000		17.873	-	17.873	0.000	39.196	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ6 / TACTICAL ENHANCEMENT

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MDD for TRILOS	▲ 1 TRILOS MDD																											
MS C TRILOS			▲ 3 MS C TRILOS																									
IOT&E for TRILOS			■ IOT&E TRILOS																									
IOC for TRILOS							▲ 5 IOC TRILOS																					
FRP for TRILOS							▲ 6 FRP TRILOS																					
Production/ Fielding TRILOS									■ TRILOS																			
MDD for TROPO	▲ 2 TROPO MDD																											
MS C TROPO							▲ 4 MS C TROPO																					
IOT&E for TROPO											■ IOT&E TROPO																	
IOC for TROPO																												
FRP for TROPO											▲ 7 FRP TROPO																	
Production/Fielding TROPO									■ TROPO																			
NCW-R Development									■ NCW-R Development																			

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ6 / TACTICAL ENHANCEMENT

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
NCW-R Developmental Testing																												
NCW-R Certification																												
NCW-R Operational Testing																												
NCW-R Fielding																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ6 / TACTICAL ENHANCEMENT

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MDD for TRILOS	2	2017	2	2017
MS C TRILOS	3	2017	3	2017
IOT&E for TRILOS	4	2017	4	2017
IOC for TRILOS	3	2018	3	2018
FRP for TRILOS	4	2018	4	2018
Production/ Fielding TRILOS	4	2017	1	2024
MDD for TROPO	2	2017	2	2017
MS C TROPO	2	2018	2	2018
IOT&E for TROPO	3	2019	3	2019
IOC for TROPO	2	2020	2	2020
FRP for TROPO	4	2019	4	2019
Production/Fielding TROPO	3	2018	1	2024
NCW-R Development	2	2018	1	2020
NCW-R Developmental Testing	2	2020	4	2020
NCW-R Certification	3	2020	1	2021
NCW-R Operational Testing	4	2020	1	2021
NCW-R Fielding	2	2021	2	2023

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ7 / TACTICAL DIGITAL MEDIA
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EJ7: TACTICAL DIGITAL MEDIA	-	1.572	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.572
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

Tactical Digital Media (TDM) is comprised of photo, video and audio recording and editing equipment that will be assembled and issued as variant kits tailored to unit mission requirements. TDM kits address modernization gaps associated with all operational Combat Camera (COMCAM), Public Affairs (PA), and Military Information Support Operations (MISO) units. TDM provides essential imagery, multimedia products, and live interview capabilities that directly contribute to successful execution of a Commander's strategic engagement and communications strategy across the full range of military operations. TDM also provides specific imagery, video, and multimedia support to commanders through the National Command Authority (NCA) level to assist with operational planning, decision-making, combat adversary misinformation/disinformation, alter perceptions regarding coalition efforts, and provide accurate and timely information to national and international audiences. Proposed TDM equipment is entirely commercial off the shelf (COTS) which is currently in use by military organizations and commercial industry.

FY17 Base funding in the amount of \$2.467 million will be used to procure and evaluate representative candidate commercial off the shelf (COTS) camera and video equipment for effectiveness, suitability, and reliability. FY17 efforts will include planning for full rate production decision, type classification, and award of a production delivery order to support future procurements.

No FY18 RDTE funding.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Program Management	0.295	-	-	-	-
Description: Program Management comprises overall management of program execution, major events, reporting, funds execution, and contract management. Includes participation in program planning meetings and IPTs.					
Title: Test and Evaluation	0.536	-	-	-	-
Description: Test and evaluation of COTS technologies to assess their ability to meet the TDM Capability Production Document (CPD) requirements.					
Title: Procurement of Test Articles	0.741	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ7 / TACTICAL DIGITAL MEDIA

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<i>Description:</i> Photo, video, audio recording, and editing equipment necessary for purposes of evaluation, and testing against the TDM CPD requirements.					
Accomplishments/Planned Programs Subtotals	1.572	-	-	-	-

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• B68501: B68501 Tactical Digital Media (OPA)	1.191	4.441	4.958	-	4.958	5.500	5.592	5.874	-	0.000	27.556

Remarks

D. Acquisition Strategy

In accordance with the approved TDM Capabilities Production Document (CPD), the Army will be purchasing state-of-the-art COTS equipment to field media variant kits tailored to unit mission requirements. The equipment will be purchased on the Common Hardware Systems (CHS) contract, and will include warranties.

The program strategy for reaching full capability is to identify, and field a modern standardized set of digital media capabilities that enables the Army user community to acquire, and process digital media/visual information products able to be disseminated within a fully integrated Army tactical network operations environment, which includes commercial networks, and interfaces. The TDM program will replace legacy analog devices by providing state-of-the art COTS equipment supporting acquire and process operations that is centrally managed and resourced. New technologies and improvements of COTS equipment will be inserted as part of unit reset, New Equipment Fielding's or upgrades as necessary to provide users with state-of-art capabilities.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ7 / TACTICAL DIGITAL MEDIA
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support(Gov't-Core)	Sub Allot	PM Mission Command : PM Mission Command	0.154	0.300		-		-		-		-	0.000	0.454	-
Subtotal			0.154	0.300		-		-		-		-	0.000	0.454	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Articles	C/IDIQ	FIFF and CHS : APG., MD	0.240	1.022		-		-		-		-	0.000	1.262	-
Subtotal			0.240	1.022		-		-		-		-	0.000	1.262	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	IA	Multiple Govt Agencies : Locations TBD	0.854	0.250		-		-		-		-	0.000	1.104	-
Subtotal			0.854	0.250		-		-		-		-	0.000	1.104	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			1.248	1.572	0.000	-	-	-	0.000	2.820	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ7 / TACTICAL DIGITAL MEDIA

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Test and Evaluation	[Redacted]				[Redacted]																							
Hardware Procurements (OPA Funded)	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Full Rate Production Decision									1 FRP																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EJ7 / TACTICAL DIGITAL MEDIA

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Test and Evaluation	1	2017	3	2018
Hardware Procurements (OPA Funded)	4	2018	4	2022
Full Rate Production Decision	3	2018	3	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software				Project (Number/Name) EK9 / TACTICAL NETWORK OPERATIONS AND MANAGEMENT			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EK9: TACTICAL NETWORK OPERATIONS AND MANAGEMENT	-	0.000	9.348	10.514	-	10.514	8.691	27.434	30.207	35.483	0.000	121.677
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Tactical Network Operations (NetOps) Management (TNOM) will support the development and integration of the Tactical NetOps software capabilities in support of NetOps Convergence, Army Objectives and emerging Cyber Center of Excellence (CCOE) requirements. The end state program is designed to synchronize LandWarNet, Network-enabled Mission Command, and Global Information Grid 2.0 Network Operations (NetOps) efforts in an integrated and interoperable framework, spanning all echelons of command and supporting the full range of military operations for Army, Joint, and Coalition Forces in order to ensure converged NetOps. The initial mission is convergence of DoD Information Network (DoDIN) functions into a single integrated set of Tactical NetOps and Management software. This integrated solution provides NetOps capability to manage Tactical Networks from the Soldier to the Enterprise network entry point and supports the implementation of integrated NetOps for Unified Network Operations (UNO). UNO will deliver a standardized visualization capability (integrating both Upper and Lower Tactical Internet NetOps) in order to reduce complexity and inform the military decision making processes. UNO will also provide enhanced capability to detect, respond, and restore from cyber incidents.

FY19 funding will continue supporting the Analysis of Alternatives (AoA) to include supporting efforts for the development of Network Operations software, enhancing Network Visualization and Monitoring of the tactical network, standardizing data definition and storage to support Common Operational Picture, and simplify planning and configuration process for multiple network devices and radios. FY19 funding will continue supporting NetOps capability enhancements via an adapt and buy strategy. The UNO Program Office Management will utilize FY19 funding in support of requisite milestone documentation preparation prior to a projected 4QFY20 milestone decision. FY19 funding will continue supporting the NetOps capability enhancements via an adapt and buy strategy. The NetOps capability enhancements that will be developed through the adapt and buy strategy supporting Unit Task Reorganization (UTR) prototypes, Joint Enterprise Network Manager (JENM) prototypes, Commercial Net Management System (NMS) prototypes, and Initiating Planner Consolidation prototypes.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	-	7.348	8.241	-	8.241
Description: Network Operations Development					
FY 2018 Plans: FY18 funding will support the Analysis of Alternatives (AoA) to include supporting efforts for the development of Network Operations software, enhancing Network Visualization and Monitoring of the tactical network,					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EK9 / TACTICAL NETWORK OPERATIONS AND MANAGEMENT

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>standardizing data definition and storage to support Common Operational Picture, and simplify planning and configuration process for multiple network devices and radios.</p> <p>FY 2019 Base Plans: FY19 funding will complete support to the Analysis of Alternatives (AoA) to include supporting efforts for the development of Network Operations software, enhancing Network Visualization and Monitoring of the tactical network, standardizing data definition and storage to support Common Operational Picture, and simplify planning and configuration process for multiple network devices and radios. FY19 funding will continue supporting NetOps capability enhancements via an adapt and buy strategy supporting Unit Task Reorganization (UTR) prototypes, Joint Enterprise Network Manager (JENM) prototypes, Commercial Net Management System (NMS) prototypes, and Initiating Planner Consolidation prototypes.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: The increase from FY18 to FY19 is due to continued AoA development and NetOps capability enhancements via an adapt and buy OTA prototyping strategy. The NetOps capability enhancements that will be developed through the adapt and buy strategy supporting Unit Task Reorganization (UTR) prototypes, Joint Enterprise Network Manager (JENM) prototypes, Commercial Net Management System (NMS) prototypes, and Initiating Planner Consolidation prototypes.</p>					
<p>Title: Management Services</p> <p>Description: Program Management Support</p> <p>FY 2018 Plans: FY18 funding will support Program Office Management, AoA development and supporting System Engineering for NetOps with subsequent efforts for capability development documentation.</p> <p>FY 2019 Base Plans: FY19 funding will support Program Office Management, AoA development, leveraging the UNO Information Systems Initial Capability Document (IS ICD) to prepare milestone documentation in support of a Milestone B decision anticipated for 4th Quarter FY20, and supporting System Engineering for NetOps with subsequent efforts for capability development documentation. FY19 funding will continue supporting NetOps capability enhancements via an adapt and buy strategy supporting Unit Task Reorganization (UTR) prototypes, Joint</p>	-	2.000	2.273	-	2.273

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EK9 / TACTICAL NETWORK OPERATIONS AND MANAGEMENT

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Enterprise Network Manager (JENM) prototypes, Commercial Net Management System (NMS) prototypes, and Initiating Planner Consolidation prototypes..					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> The increase from FY18 to FY19 is due to continued AoA development and NetOps capability enhancements via an adapt and buy OTA prototyping strategy. The NetOps capability enhancements that will be developed through the adapt and buy strategy supporting Unit Task Reorganization (UTR) prototypes, Joint Enterprise Network Manager (JENM) prototypes, Commercial Net Management System (NMS) prototypes, and Initiating Planner Consolidation prototypes.					
Accomplishments/Planned Programs Subtotals	-	9.348	10.514	-	10.514

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

N/A

Remarks

D. Acquisition Strategy

Tactical Network Operations (NetOps) Management (TNOM) is built to deliver the capabilities described in the LandWarNet, Network-enabled Mission Command, and Global Information Grid 2.0 Initial Capabilities Documents (ICD) as refined by the Analysis of Alternatives (AoA). The AoA is replacing the ITNO Capability Production Document (CPD) strategy to align with Army priorities. An AROC decision followed by MDD is anticipated in 3rd Quarter 2018 to initiate the AoA. FY19 will complete AoA development to include supporting efforts for the development of Network Operations software, enhancing Network Visualization and Monitoring of the tactical network, standardizing data definition and storage to support Common Operational Picture, and simplify planning and configuration process for multiple network devices and radios. FY19 will also include Program Office Management support and subsequent efforts for capability development documentation.

The AoA will scope an integrated solution which provides NetOps capabilities to manage Tactical Networks from the Soldier to the Theater network entry point and supports the implementation of integrated NetOps for Unified Network Operations (UNO). After AoA completion, anticipate an UNO Information Systems Initial Capability Document (IS ICD) to support a Milestone B decision anticipated for 4th Quarter FY20 with a contract award immediately following approval to enter Engineering and Manufacturing Development Phase. The program plans to develop and deliver software, and conduct developmental and operational tests. A Limited Fielding Decision will follow testing.

In FY18-FY20, TNOM will continue supporting the NetOps capability enhancements via an adapt and buy OTA prototyping strategy. The NetOps capability enhancements that will be developed through the adapt and buy strategy supporting Unit Task Reorganization (UTR) prototypes, Joint Enterprise Network Manager (JENM) prototypes, Commercial Net Management System (NMS) prototypes, and Initiating Planner Consolidation prototypes.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	Project (Number/Name) EK9 / <i>TACTICAL NETWORK OPERATIONS AND MANAGEMENT</i>

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EK9 / TACTICAL NETWORK OPERATIONS AND MANAGEMENT
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support	C/TBD	Various : Various	-	-		2.000		2.273	Apr 2019	-		2.273	Continuing	Continuing	Continuing
Subtotal			-	-		2.000		2.273		-		2.273	Continuing	Continuing	N/A

Remarks
 AoA Support, MS B Support, capability enhancements via an adapt and buy strategy, Program Office Management and System Engineering Management and Services
 The NetOps capability enhancements that will be developed through the adapt and buy strategy supporting Unit Task Reorganization (UTR) prototypes, Joint Enterprise Network Manager (JENM) prototypes, Commercial Net Management System (NMS) prototypes, and Initiating Planner Consolidation prototypes.

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Product Development	C/TBD	TBD : TBD	-	-		7.348		8.241	Nov 2018	-		8.241	0.000	15.589	-
Subtotal			-	-		7.348		8.241		-		8.241	0.000	15.589	N/A

Remarks
 Supports development of Analysis of Alternatives and subsequent System Engineering of NetOps in support of follow on capability documentation.

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	9.348	10.514	-	10.514	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EK9 / TACTICAL NETWORK OPERATIONS AND MANAGEMENT

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
UNO IS ICD Approved					1 ▲ ICD Approved																							
MDD					2 ▲ MDD																							
Aquisition Decision Memorandum					3 ▲ ADM																							
OTA Prototyping 1					Unit Task Reorganization (UTR) OTA Prototyping																							
AoA Development					AoA Development																							
OTA Prototyping 2					Joint Enterprise Network Manager (JENM) OTA Prototyping																							
OTA Prototyping 3					Commercial Net Management System (NMS) OTA Prototyping																							
OTA Prototyping 4									Initiating Planner Consolidation OTA Prototyping																			
Milestone B																	4 ▲ MS B											
Contract Award																	5 ▲ Contract Award											
Software Development																	Development Efforts 1											
Risk Reduction Event																	RRE 1											
Developmental Test																					DT1							

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EK9 / TACTICAL NETWORK OPERATIONS AND MANAGEMENT

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Regression Test																					■ RT1											
Operational Test																									■ OT1							
Risk Reduction Event 2																									■ RRE 2							
Developmental Test 2																									■ DT2							
Regression Test 2																									■ RT2							
Operational Test 2																									■ OT2							
Limited Fielding Decision																													▲ 6 LFD			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EK9 / TACTICAL NETWORK OPERATIONS AND MANAGEMENT

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
UNO IS ICD Approved	2	2018	2	2018
MDD	3	2018	3	2018
Aquisition Decision Memorandum	3	2018	3	2018
OTA Prototyping 1	3	2018	2	2019
AoA Development	3	2018	3	2019
OTA Prototyping 2	3	2018	3	2019
OTA Prototyping 3	4	2018	3	2019
OTA Prototyping 4	3	2019	4	2020
Milestone B	4	2020	4	2020
Contract Award	1	2021	1	2021
Software Development	1	2021	2	2022
Risk Reduction Event	2	2021	3	2021
Developmental Test	1	2022	1	2022
Regression Test	1	2022	2	2022
Operational Test	2	2022	3	2022
Risk Reduction Event 2	4	2022	1	2023
Developmental Test 2	1	2023	1	2023
Regression Test 2	2	2023	2	2023
Operational Test 2	2	2023	3	2023
Limited Fielding Decision	4	2023	4	2023

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	Project (Number/Name) EK9 / <i>TACTICAL NETWORK OPERATIONS AND MANAGEMENT</i>

Note
Program projects AoA will scope entering the Engineering and Manufacturing Development phase with initial software development efforts supporting developmental and operational tests for a limited fielding decision.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software				Project (Number/Name) EQ8 / Mobile/Handheld Computing Environment (M/HHCE)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EQ8: <i>Mobile/Handheld Computing Environment (M/HHCE)</i>	-	17.680	11.850	9.489	-	9.489	9.562	9.765	8.874	8.107	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Nett Warrior (NW) Program (named in honor of Medal of Honor recipient Colonel Robert C. Nett), also known as the Ground Soldier System (GSS) Program, leverages commercial smart devices and secure Army tactical radios to provide the dismounted leader an integrated mission command and situational awareness system for use during combat operations. The NW system provides leaders electronic real-time information on friendly positions; information about enemy activity and movement; navigational data and map imagery; a collaborative planning tool; and other mission related graphics which effectively puts the power of the entire Army tactical network in the hands of the dismounted leader. The NW system also provides the same integrated mission command capability to the tactical vehicle-mounted leaders so that when dismounted, the leader still maintains the common operating picture (COP) and has continuous situational awareness. This capability provides unparalleled situational awareness and enhanced communications to the dismounted leader allowing for faster, more accurate decisions and reduced fratricide in the tactical fight. Includes integration and interface of products on Soldiers.

The continued development and integration of the NW program also integrates applications from other programs aimed at considerably reducing the weight and bulk of the dismounted Soldier's load by using a single End User Device. The NW program harnesses Soldiers' experience in combat operations and employs combat veterans for Soldier feedback enhancing human factors design and fightability of the system. This project funds the following: 1) Incorporation of additional new hardware applications and capabilities into Nett Warrior, 2) Yearly developmental and operational tests of the NW with continually advancing commercial smart device technology inserted, 3) Software development for planned updates, 4) Integration of new End User Devices with the existing and re-competed Army Tactical Radios, including vehicle power integration, 5) Government led integration and system engineering and program management, and 6) Integration with emerging transport systems.

Note: FY16 and prior funding for Nett Warrior resided in 0604827A (Soldier Systems - Warrior Dem/Val) Project S75 (Ground Soldier Ensemble).

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Test and Evaluation	2.119	2.139	1.971	-	1.971
Description: Test and Evaluation including annual Network Integration Evaluation (NIE) and Army Warfighting Assessment (AWA) to gain Soldier feedback.					
FY 2018 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018			
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EQ8 / Mobile/Handheld Computing Environment (M/HHCE)				
B. Accomplishments/Planned Programs (\$ in Millions)						
		FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue NW test and 3rd party applications evaluation for technical verification at developmental test events and user verification. Support NW as a baseline CIE and JWA system including: Brigade level support, equipping, training, and spares for NW; conduct yearly Army Interoperability Certification; environmental testing; and Information Assurance penetration prevention testing for new commercial smart devices, software and accessories. Support Army Expeditionary Warrior Experiment (AEWE) testing.						
FY 2019 Base Plans: Continue NW test and 3rd party applications evaluation for technical verification at developmental test events and user verification. Conduct a planned Follow-on Test and Evaluation (FOT&E). Support NW as a baseline CIE and JWA system including: Brigade level support, equipping, training, and spares for NW; conduct yearly Army Interoperability Certification; environmental testing; and Information Assurance penetration prevention testing for new commercial smart devices, software and accessories. Support Army Expeditionary Warrior Experiment (AEWE) testing.						
FY 2018 to FY 2019 Increase/Decrease Statement: Reduction is due to reduced operational test events in FY19.						
Title: Hardware and Software Integration and Evaluation for Capability Improvements		4.323	3.496	3.758	-	3.758
Description: Hardware and Software Integration and Evaluation for Capability Improvements						
FY 2018 Plans: Continue to evaluate next End User Devices (EUD) and associated hardware components to stay aligned with commercial and Army evolving requirements. Provide NW software / hardware updates to support incorporation of 3rd party applications onto NW EUD platform, Army Interoperability Certification (AIC) and cyber security testing. Support DARPA Squad X integration and transition.						
FY 2019 Base Plans: Continue to evaluate next End User Devices (EUD) and associated hardware components to stay aligned with commercial and Army evolving requirements. Provide NW software / hardware updates to support incorporation of 3rd party applications onto NW EUD platform, Army Interoperability Certification (AIC) and cyber security testing. Support DARPA Squad X integration and transition.						
FY 2018 to FY 2019 Increase/Decrease Statement: Increased hardware/software integration required.						
Title: Software Development & Integration		1.333	2.744	1.002	-	1.002

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EQ8 / Mobile/Handheld Computing Environment (M/HHCE)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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<p>Description: Funding is provided for the following efforts.</p> <p>FY 2018 Plans: Continue to evaluate next generation NW map engine and Operating System (OS) trade studies and initiate assured Position, Navigation and Timing (PNT) software development efforts with NW. Update NW Software Development Kit (SDK) with new functionality. Continue incorporating the Army's Common Operating Environment (COE) 3.0 Cross-Cutting Capabilities into NW software. Continue development of NW's next generation Service Oriented Architecture.</p> <p>FY 2019 Base Plans: Continue to evaluate next generation NW map engine and Operating System (OS) trade studies and assured Position, Navigation and Timing (PNT) software development efforts with NW. Update NW Software Development Kit (SDK) with new functionality. Continue incorporating the Army's Common Operating Environment (COE) 3.0 Cross-Cutting Capabilities into NW software. Continue development of NW's next generation Service Oriented Architecture.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Reduction is due to reconfiguration of personnel and associated duties at the Software Integration Lab (SIL).</p>					
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<p>Title: Conduct SEPM Support to NW</p> <p>Description: Conduct Systems Engineering and Program Management Support to Nett Warrior</p> <p>FY 2018 Plans: Continue to conduct government systems / software engineering and program management support for NW program. Will collect input from Soldiers to improve NW size, weight, power, fightability, safety and effectiveness via surveys. Will manage system configuration, and execute test, development and integration planning including investigation and analysis of emerging innovative commercial technologies to lower the size, weight, power, cost and increase Nett Warrior functionality.</p> <p>FY 2019 Base Plans: Continue to conduct government systems / software engineering and program management support for NW program. Will collect input from Soldiers to improve NW size, weight, power, fightability, safety and effectiveness via surveys. Will manage system configuration, and execute test, development and integration planning</p>	2.405	2.699	2.086	-	2.086
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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EQ8 / Mobile/Handheld Computing Environment (M/HHCE)
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
including investigation and analysis of emerging innovative commercial technologies to lower the size, weight, power, cost, and increase Nett Warrior functionality.					
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 SEPM reduced to align with the reduced operational test events.					
Title: MHHCE Governance	-	0.772	0.672	-	0.672
FY 2018 Plans: Provide Mobile Handheld Computing Environment (MHH/CE) governance and standards development for external program integration to eliminate separate handheld devices and reduce Soldier load.					
FY 2019 Base Plans: Continue to provide Mobile Handheld Computing Environment (MHH/CE) governance and standards development for external program integration to eliminate separate handheld devices and reduce Soldier load.					
FY 2018 to FY 2019 Increase/Decrease Statement: Funding supports planned MHHCE governance requirements.					
Title: Soldier Borne Sensor (FY17 Congressional Increase)	7.500	-	-	-	-
Accomplishments/Planned Programs Subtotals	17.680	11.850	9.489	-	9.489

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• R80501: Ground Soldier System	32.419	38.219	92.487	1.725	94.212	36.976	35.708	60.447	63.488	0.000	361.469

Remarks

D. Acquisition Strategy
The Nett Warrior (NW) program provides unparalleled situational awareness and mission command to dismounted combat leaders through a secure commercial smart device, power source, cables and tactical radio. The NW is focused on Team Leader and higher echelons and provides an integrated secure information-centric Commercial-Off-The Shelf (COTS) mobile application-based computation platform with data collection, enhanced SA, mission planning, and navigational aid functions overlaid on geo-referenced maps and high resolution imagery throughout a brigade. The NW enables real-time ground tactical-level knowledge sharing and command and control (C2), directly impacting combat effectiveness and decision-making. The NW also improves lower echelon intelligence production and analysis capabilities which are central to efficient and effective counter-insurgency warfare. NW program completed LRIP/MS C in 2012 followed by two LRIP decisions in 2013-14 in preparation for IOT&E under DOT&E oversight in 4QFY14-1QFY15. This IOT&E event led to an additional NW Low Rate Initial Production (LRIP) decision in 2015 and

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / <i>Army Tactical Command & Control Hardware & Software</i>	Project (Number/Name) EQ8 / <i>Mobile/Handheld Computing Environment (M/HHCE)</i>
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a Full Rate Production Decision is planned for early FY18. From this decision NW will complete annual production and fielding events based on yearly development, integration and testing of emerging advanced smart devices to lower cost, weigh and power. To capitalize on commercial industry's investment in advanced smart device technology as well as innovation and changes within Army, NW requires annual RDT&E funding for integration and evaluation. Through this process and at low cost, the Army is able to integrate and evaluate for combat utility the hundreds of millions spent in product development by the major commercial device manufactures.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604818A / Army Tactical Command & Control Hardware & Software				EQ8 / Mobile/Handheld Computing Environment (M/HHCE)							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering & Program Management Support	Various	Various : Various	-	2.405		2.699		2.086		-		2.086	Continuing	Continuing	-
Subtotal			-	2.405		2.699		2.086		-		2.086	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Hardware/Software Integration & Evaluation	Various	Various : Various	-	4.323		3.496		3.578		-		3.578	Continuing	Continuing	-
Soldier Borne Sensor	MIPR	Various : Various	-	7.500		0.772		1.752		-		1.752	0.000	10.024	-
Subtotal			-	11.823		4.268		5.330		-		5.330	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development and Integration	Various	Various : Various	-	1.333		2.744		1.002		-		1.002	Continuing	Continuing	-
Subtotal			-	1.333		2.744		1.002		-		1.002	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Various Testing Organizations	Various	Various : Various	-	2.119		2.139		1.071		-		1.071	Continuing	Continuing	-
Subtotal			-	2.119		2.139		1.071		-		1.071	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army								Date: February 2018			
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software				Project (Number/Name) EQ8 / Mobile/Handheld Computing Environment (M/HHCE)			
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	-	17.680	11.850	9.489	-	9.489	Continuing	Continuing	N/A		

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EQ8 / Mobile/Handheld Computing Environment (M/HHCE)

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
New EUD test and evaluation + LTE (DT) FY17	█																											
PFED Inc 2 integration and evaluation FY17		█	█	█																								
New Hardware capability testing (environmental/CRBRNE intelligence) FY17			█																									
New EUD test and evaluation + LTE (OT) FY17			█																									
Software Update Testing (CS-18/19) FY17			█																									
Mobile Hand Held Compliance Testing (FY17)			█																									
Robotics and Mobile Sensor Integration FY18						█	█																					
Software Update Integration FY18							█																					
New Hardware capability testing (environmental/CRBRNE intelligence) FY18								█																				
PFED Inc 2 integration and evaluation FY18								█																				
TCAPS Integration FY18								█																				
New EUD test and evaluation + LTE (DT) FY18												█																
Robotics and Mobile Sensor Testing FY18																█												

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EQ8 / Mobile/Handheld Computing Environment (M/HHCE)	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Mobile Hand Held Compliance Testing FY18									■																			
New EUD test and evaluation + LTE (OT) FY19									■																			
DARPA Squad X transition Phase 1 FY19									■																			
Mech Unit with Nett Warrior DT FY19									■																			
Software Update Testing (CS-18/19) FY19									■																			
New Hardware capability testing (environmental/CRBRNE intelligence) FY19									■																			
Robotics and Mobile Sensor Integration FY19									■																			
TCAPS Integration FY19									■																			
Mobile Hand Held Compliance Testing (FY19)									■																			
Robotics and Mobile Sensor Testing FY19									■																			
New EUD test and evaluation + LTE (DT) FY20									■																			
DARPA Squad X transition Phase 2 FY20									■																			
New Hardware capability testing (environmental/CRBRNE intelligence) FY20									■																			

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EQ8 / Mobile/Handheld Computing Environment (M/HHCE)	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023															
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4												
Mobile Hand Held Compliance Testing (FY20)																																								
Mech Unit with Nett Warrior DT FY20																																								
Robotics and Mobile Sensor Testing FY20																																								
Software Update Integration FY20																																								
Robotics and Mobile Sensor Integration FY20																																								
TCAPS Integration FY20																																								
DARPA Squad X transition formal Testing FY21																																								
Robotics and Mobile Sensor Testing FY21																																								
New EUD test and evaluation + LTE (OT) FY21																																								
New Hardware capability testing (environmental/CRBRNE intelligence) FY21																																								
Software Update Testing (CS-18/19) FY21																																								
Mobile Hand Held Compliance Testing (FY21)																																								
Mech Unit with Nett Warrior OT FY21																																								

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EQ8 / Mobile/Handheld Computing Environment (M/HHCE)

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023																			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4																
DARPA Squad X transition Phase 2 FY21																																												
Software Update Integration FY21																																												
Mobile Hand Held Compliance Testing (FY22)																																												
Software Update Integration FY22																																												
Mobile Hand Held Compliance Testing (FY23)																																												
Software Update Integration FY23																																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EQ8 / Mobile/Handheld Computing Environment (M/HHCE)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
New EUD test and evaluation + LTE (DT) FY17	1	2017	1	2017
PFED Inc 2 integration and evaluation FY17	2	2017	4	2017
New Hardware capability testing (environmental/CRBRNE intelligence) FY17	3	2017	3	2017
New EUD test and evaluation + LTE (OT) FY17	3	2017	3	2017
Software Update Testing (CS-18/19) FY17	3	2017	3	2017
Mobile Hand Held Compliance Testing (FY17)	3	2017	4	2017
Robotics and Mobile Sensor Integration FY18	1	2018	2	2018
Software Update Integration FY18	2	2018	2	2018
New Hardware capability testing (environmental/CRBRNE intelligence) FY18	3	2018	3	2018
PFED Inc 2 integration and evaluation FY18	3	2018	4	2018
TCAPS Integration FY18	3	2018	3	2018
New EUD test and evaluation + LTE (DT) FY18	3	2018	4	2018
Robotics and Mobile Sensor Testing FY18	4	2018	4	2018
Mobile Hand Held Compliance Testing FY18	4	2018	4	2018
New EUD test and evaluation + LTE (OT) FY19	1	2019	2	2019
DARPA Squad X transition Phase 1 FY19	1	2019	4	2019
Mech Unit with Nett Warrior DT FY19	2	2019	2	2019
Software Update Testing (CS-18/19) FY19	2	2019	3	2019
New Hardware capability testing (environmental/CRBRNE intelligence) FY19	3	2019	3	2019
Robotics and Mobile Sensor Integration FY19	3	2019	3	2019
TCAPS Integration FY19	4	2019	4	2019
Mobile Hand Held Compliance Testing (FY19)	4	2019	4	2019

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EQ8 / Mobile/Handheld Computing Environment (M/HHCE)
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Events	Start		End	
	Quarter	Year	Quarter	Year
Robotics and Mobile Sensor Testing FY19	4	2019	4	2019
New EUD test and evaluation + LTE (DT) FY20	1	2020	1	2020
DARPA Squad X transition Phase 2 FY20	1	2020	4	2020
New Hardware capability testing (environmental/CRBRNE intelligence) FY20	2	2020	3	2020
Mobile Hand Held Compliance Testing (FY20)	4	2020	4	2020
Mech Unit with Nett Warrior DT FY20	2	2020	2	2020
Robotics and Mobile Sensor Testing FY20	4	2020	4	2020
Software Update Integration FY20	2	2020	2	2020
Robotics and Mobile Sensor Integration FY20	3	2020	4	2020
TCAPS Integration FY20	3	2020	3	2020
DARPA Squad X transition formal Testing FY21	1	2021	4	2021
Robotics and Mobile Sensor Testing FY21	1	2021	3	2021
New EUD test and evaluation + LTE (OT) FY21	2	2021	3	2021
New Hardware capability testing (environmental/CRBRNE intelligence) FY21	2	2021	3	2021
Software Update Testing (CS-18/19) FY21	2	2021	3	2021
Mobile Hand Held Compliance Testing (FY21)	4	2021	4	2021
Mech Unit with Nett Warrior OT FY21	3	2021	3	2021
DARPA Squad X transition Phase 2 FY21	2	2021	3	2021
Software Update Integration FY21	4	2021	4	2021
Mobile Hand Held Compliance Testing (FY22)	3	2022	3	2022
Software Update Integration FY22	4	2022	4	2022
Mobile Hand Held Compliance Testing (FY23)	3	2022	3	2023
Software Update Integration FY23	4	2022	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software				Project (Number/Name) ER9 / Command Post Integrated Infrastructure			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ER9: <i>Command Post Integrated Infrastructure</i>	-	0.000	20.000	44.685	-	44.685	15.391	12.453	25.317	27.339	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Command Post is line of effort 4 of the Army Modernization strategy. Program Executive Office for Command, Control and Communications - Tactical (PEO C3T) will develop mobile Command Post solutions by integrating supporting mission command and communications systems in accordance with a Directed Requirement (14 Dec 2017) and Capability Development Document. CPI2 replaces legacy command post systems at Corps, Division, and Brigade Combat Team and below command post formations with more capable, survivable, agile, and scalable command post solutions. It will ensure information and support systems are introduced into the Command Post through physical integration allowing the commander to tailor the Command Post as missions dictate. CPI2 was established to meet the emerging threat environment to improve the survivability and mobility of current Command Posts. The Directed Requirement First Unit Equipped is in FY20.

FY19 funding provides for acquiring platforms for System Design, Prototyping and integration solutions for select Mission Command Platforms (MCP) and Command Post Support Vehicles (CPSV). The CPSV is a formation appropriate vehicle that hosts mission command servers, radios, local area network systems and unified voice management capability and secure wireless in support of the Integrated Command Post at the Halt. The MCP is a formation appropriate vehicle that provides a digitally connected workspace to support commanders and staff at the Corps/Division Command Group, Main and Tactical Command Posts and at the Brigade and Battalion Command Posts and Command Groups. FY19 funding will also support the procurement of two brigade sets of coalition gateways to prototype and assess existing solutions to provide the Army a seamless information network exchanges and integration of Joint and legacy radios as an interim solution toward the future transport layer. It will provide commanders a rugged and portable air-to-ground command and control capability that enables Link 16, a simultaneous line-of-sight and/or satellite communication. The Army seeks an integrated message translation capability to form incompatible messages from disparate networks into a clear common operating picture, improving the prevention of fratricide and collateral damage while also raising ISR visibility.

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

Title: Product Development

FY 2018 Plans:

Product Development supports Directed Requirement for System Design and Prototyping, Platform Integration, Assembly, Test and Checkout of M1087 Mission Command Platform and M1079 and JLTV variants of the Command Post Support Vehicle, and required certifications for safety and transportability.

FY 2019 Base Plans:

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
	-	16.885	16.000	-	16.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) ER9 / Command Post Integrated Infrastructure			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Product Development supports Directed Requirement for acquiring select platforms for System Design, Prototyping, Platform Integration, Assembly, and test for Mission Command Platform (MCP), Command Post Support Vehicle, ISO Containers, and required certifications for safety and transportability. FY 2018 to FY 2019 Increase/Decrease Statement: Nominal cost delta between FY18 and FY19.					
Title: Coalition Gateway Experimentation FY 2019 Base Plans: FY19 funding support the procurement of two brigade sets of coalition gateways to prototype and assess existing solutions to provide the Army a seamless information network exchanges and integration of Joint and legacy radios. FY 2018 to FY 2019 Increase/Decrease Statement: New effort in FY19	-	-	21.455	-	21.455
Title: Systems Test and Evaluation FY 2018 Plans: Supports development of the Developmental Test plan FY 2019 Base Plans: Continue development of the Test & Evaluation Master Plan (TEMP) and execute Developmental Test (DT). FY 2018 to FY 2019 Increase/Decrease Statement: Inflation and test documentation efforts.	-	1.115	1.375	-	1.375
Title: Program Office Management FY 2018 Plans: Program Office Management and Support FY 2019 Base Plans: Program management and support necessary to perform CPI2 mission. FY 2018 to FY 2019 Increase/Decrease Statement: FY19 staffing ramps up to include addition of Logistical staff necessary to facilitate CPI2 mission to include Fielders, Training Manager, Logisticians, and Tech Writers.	-	2.000	5.855	-	5.855
Accomplishments/Planned Programs Subtotals	-	20.000	44.685	-	44.685

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) ER9 / Command Post Integrated Infrastructure

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

<u>Line Item</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>FY 2023</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• B29801: CPI2	-	-	2.855	-	2.855	38.980	48.587	21.735	49.403	Continuing	Continuing

Remarks

D. Acquisition Strategy

FY18-FY21 Directed Requirement for CPI2 will leverage existing contracts managed by Project Manager (PM) Joint Light Tactical Vehicle (JLTV) and Project Manager (PM) Stryker Brigade Combat Team (SBCT) for integration efforts associated with JLTV and Stryker. CPI2 will use a Functional Support Agreement for the prototype development of the M1079 Command Post Support Vehicle (CPSV) and an Other Transaction Authority (OTA) contract for the prototype development of the M1087 Mission Command Platform (MCP). One Early User Test (EUT) will be executed with the intended First Unit Equipped (FUE) unit to allow feedback into the initial Command Post (CP) design. A Request For Proposal (RFP) will be released for a production contract for the M1079 CPSV in 1QFY20 with a projected award in 3QFY20 to produce four brigade sets. The OTA contract will be used to produce four brigade sets of M1087 MCPs.

The CPI2 Capability Development Document (CDD) is projected for Army Requirements Oversight Council (AROC) approval in FY18 with a Milestone B projected for 1QFY20. Competitive contract award planned for 1QFY21 based on Request For Proposal (RFP) responses and source selection process. This contract will be a 5-year Firm Fixed Priced/Cost Plus Fixed Fee (FFP/CPFF) contract for the design, engineering, prototyping, Developmental Test (DT), new equipment training, one Limited User Test (LUT), and one Operational Test (OT) which will encompass CPI2 variants at Division HQ and BCT echelons with Option Years for production. CPI2 will leverage existing contracts managed by PM JLTV and PM SBCT for integration efforts associated with JLTV and Stryker.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604818A / Army Tactical Command & Control Hardware & Software				ER9 / Command Post Integrated Infrastructure							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office Management	Allot	Various : Various	-	-		2.000		5.855	Oct 2018	-		5.855	Continuing	Continuing	Continuing
Subtotal			-	-		2.000		5.855		-		5.855	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/TBD	TBD : TBD	-	-		16.885		-		-		-	0.000	16.885	-
CPSV Design/Fabrication/Integration (FSA)	MIPR	CERDEC : Aberdeen	-	-		-		7.500	Jan 2019	-		7.500	Continuing	Continuing	-
MCP Design/Fabrication/Integration (OTA)	C/TBD	TBD : TBD	-	-		-		8.500	Jan 2019	-		8.500	Continuing	Continuing	-
Subtotal			-	-		16.885		16.000		-		16.000	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Test and Evaluation	C/TBD	TBD : TBD	-	-		1.115		1.375	Apr 2019	-		1.375	Continuing	Continuing	Continuing
Coalition Gateway Prototyping and assesment	TBD	TBD : TBD	-	-		-		21.455	Jan 2019	-		21.455	0.000	21.455	-
Subtotal			-	-		1.115		22.830		-		22.830	Continuing	Continuing	N/A
Project Cost Totals			-	-		20.000		44.685		-		44.685	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) ER9 / Command Post Integrated Infrastructure

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023											
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
Directed Requirement Approval					▲ 1 DR AROC Approval																															
Program of Record CPI2 AROC Approval (CDD)					▲ 2 CPI2 AROC Approval (CDD)																															
Program of Record (POR) CPI2 MDD					▲ 3 CPI2 MDD																															
Directed Requirement (Phase 2) Design, Prototype, and Developmental Test									DR Design, Prototype & DT																											
Directed Requirement (Phase 2) New Equipment Training									DR NET																											
CPI2 (POR) Milestone B									▲ 4 CPI2 MS B																											
Acquire Coalition Gateways																					Acquire Coalition Gateways															
Prototyping Coalition Gateways																					Prototyping Coalition Gateways															
Directed Requirement (Phase 2) Unit Assessments																					DR Unit Assess															
Directed Requirement (Phase 2) CMR																					DR CMR															
Directed Requirement (Phase 2) Fieldings																					DR Fieldings															
CPI2 (POR) Contract Award																					▲ 5 CPI2 Contract Award															
CPI2 (POR) Limited User Test																					CPI2 LUT															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software		Project (Number/Name) ER9 / Command Post Integrated Infrastructure	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
CPI2 (POR) Milestone C																									6							
CPI2 (POR) Operational Test and Evaluation																																

6
CPI2 MS C

CPI2 OT&E

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) ER9 / Command Post Integrated Infrastructure

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Directed Requirement Approval	1	2018	1	2018
Program of Record CPI2 AROC Approval (CDD)	2	2018	2	2018
Program of Record (POR) CPI2 MDD	2	2018	2	2018
Directed Requirement (Phase 2) Design, Prototype, and Developmental Test	3	2018	4	2020
Directed Requirement (Phase 2) New Equipment Training	1	2020	1	2020
CPI2 (POR) Milestone B	1	2020	1	2020
Acquire Coalition Gateways	2	2019	2	2019
Prototyping Coalition Gateways	2	2019	2	2020
Directed Requirement (Phase 2) Unit Assessments	1	2020	1	2021
Directed Requirement (Phase 2) CMR	3	2020	3	2020
Directed Requirement (Phase 2) Fieldings	4	2020	4	2021
CPI2 (POR) Contract Award	1	2021	1	2021
CPI2 (POR) Limited User Test	2	2022	3	2022
CPI2 (POR) Milestone C	4	2022	4	2022
CPI2 (POR) Operational Test and Evaluation	2	2023	2	2023

Note

Directed Requirement FY18-FY21. RDTE activities FY18-FY20/Procurement activities FY20-FY21.
 Program of Record to begin FY20. RDTE activities FY20-FY24/Procurement activities to begin in FY23

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software				Project (Number/Name) EW3 / Unit Task Reorganization (UTR) Development			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EW3: Unit Task Reorganization (UTR) Development	-	11.777	25.969	18.835	-	18.835	30.539	28.821	25.333	20.517	0.000	161.791
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The FY 2019 funding request was reduced by 5.393 million to account for the availability of prior year execution balances.

A. Mission Description and Budget Item Justification

The Unit Task Reorganization (UTR) effort leverages and integrates existing PEO C3T systems for the S3 and Signal Soldiers that enables them to visualize their current network, make adjustments to support the mission, determine what and how changes need to be made, and then, make the changes to the network over the air. The UTR effort supports the Army's modernization strategy number 4: an "Army Network with hardware, software and infrastructure - sufficiently mobile and expeditionary - that can fight in any environment where the electromagnetic spectrum is denied or degraded." The program sub-divides UTR into Network Sustainment, Network Planning, and Network Re-Establishment.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Network Management Description: Efforts to create dynamic display of the runtime network FY 2019 Base Plans: Tactical Radio Management, Identity and Access Management, Network Configuration Management, Help Desk/ Incident Management FY 2018 to FY 2019 Increase/Decrease Statement: Alignment of FY18 operational capabilities (Crypto Management, Tactical Radio Management, IP Address Management, Network Configuration Management, Signal Running Estimate) to Network Management in FY19.	6.541	-	6.876	-	6.876
Title: IP Address Management Description: A SoS capability to dynamically track Internet Protocol address space used in a network. IPAM automatically assigns IP addresses to communications assets authenticating with the network, tracks IP block allocations to subordinates, assignments to communications assets, changes to assignments, multicast groups and assignments, etc. It enables and tracks requests to HHQ for more IP space when required. FY 2018 Plans:	-	0.675	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software		Project (Number/Name) EW3 / Unit Task Reorganization (UTR) Development	
B. Accomplishments/Planned Programs (\$ in Millions)					
A SoS capability to dynamically track Internet Protocol address space used in a network. IPAM automatically assigns IP addresses to communications assets authenticating with the network, tracks IP block allocations to subordinates, assignments to communications assets, changes to assignments, multicast groups and assignments, etc. It enables and tracks requests to HHQ for more IP space when required.					
FY 2018 to FY 2019 Increase/Decrease Statement: Alignment of effort to Network Management in FY19.					
Title: Tactical Radio Management					
Description: A dynamic SoS capability that tracks the status of operational nets (i.e. Command, Fires, Ops and Intel, Admin and Log, aviation nets, etc.)					
FY 2018 Plans: A dynamic SoS capability that tracks the status of operational nets (i.e. Command, Fires, Ops and Intel, Admin and Log, aviation nets, etc.)					
FY 2018 to FY 2019 Increase/Decrease Statement: Alignment of effort to Network Management in FY19.					
Title: Cryptographic Management					
Description: SoS capability to create a COMSEC plan that meets the mission requirements using the COMSEC assets assigned					
FY 2018 Plans: SoS capability to create a COMSEC plan that meets the mission requirements using the COMSEC assets assigned					
FY 2018 to FY 2019 Increase/Decrease Statement: Alignment of effort to Network Management in FY19.					
Title: Network Configuration Management					
Description: SoS capability that dynamically tracks which devices are on the network, how they're configured, how they are connected, provides authoritative and accurate data at each echelon, provides its data as a service to Enterprise systems, and maintains multiple last known good baseline configurations for all communications assets					
	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
	-	3.544	-	-	-
	-	1.802	-	-	-
	-	0.621	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EW3 / Unit Task Reorganization (UTR) Development

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>FY 2018 Plans: SoS capability that dynamically tracks which devices are on the network, how they're configured, how they are connected, provides authoritative and accurate data at each echelon, provides its data as a service to Enterprise systems, and maintains multiple last known good baseline configurations for all communications assets</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: No FY19 requirement.</p>					
<p>Title: Signal Running Estimate</p> <p>Description: Capability that provides one of the Mission Command Essential Capabilities (MCEC) for the BDE and BN S6s, integrated with other dynamic Network Sustainment capabilities to enable the S6s to more effectively support MDMP, and to enable the MDMP process to more effectively drive changes to the network.</p> <p>FY 2018 Plans: Capability that provides one of the Mission Command Essential Capabilities (MCEC) for the BDE and BN S6s, integrated with other dynamic Network Sustainment capabilities to enable the S6s to more effectively support MDMP, and to enable the MDMP process to more effectively drive changes to the network.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Alignment of effort to Network Management in FY19.</p>	-	0.808	-	-	-
<p>Title: Network Planning</p> <p>Description: Efforts to translate orders into configurations</p> <p>FY 2018 Plans: This is required to execute workflows involving KEYMAT. KMI funding only addresses delivery of KEYMAT from a central repository to the BDE. While OTNK and the KMI-Aware specification provide mechanisms for further dissemination, funding for adoption of those specifications is not covered by KMI. TNOM funding is not planned for prior to FY19. Engineering work is being performed under the KM WG tracing back to the UTR IPT.</p> <p>FY 2019 Base Plans: Efforts to provide Crypto Planning interface and analysis of mission threads to create workflow charts for UTR automation using Rapid Provisioning System (RPS) and other tactical capabilities.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p>	0.188	5.488	0.650	-	0.650

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EW3 / Unit Task Reorganization (UTR) Development			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Reprioritization from significant Cryptographic Planning efforts to Infrastructure and Network Management capability.					
<p>Title: Network Re-Establishment</p> <p>Description: Capability to load new configurations on a communications asset or set of communications assets either locally or remotely over the network (OTN), including over the air (OTA). Also includes activation of configurations when required, and verification that the loads and activations have taken, as well as error checking and correction prompts to reduce mistakes throughout the planning, establishment, and sustainment of the network.</p> <p>FY 2018 Plans: A SoS capability used to ?seamlessly? and ?remotely? load and activate configurations of communications assets over-the-network (OTN), including over-the-air (OTA). This is the first release extending ODIN to other waveforms and parameters and integrating with JENM, extending eOTAM, and extending RPS. Manual loaders will still be part of this capability, but only as a contingency.</p> <p>FY 2019 Base Plans: FY 2019 Plans: Enterprise Over-The-Air Management (eOTAM) automation of data exchanges between JENM and appropriately equipped SDR radios. eOTAM automates key radio management processes (COMSEC Rollover, Radio Configuration File (RCF) loading, Preset Changes, Radio Silence.) Upgrade eOTAM OSS to add RPCs to configure and query health status (for UTR required configuration parameters, not telemetry data), and a new radio health service will be developed (for TRAP-like functionality).</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Alignment of effort to Network Re-Establishment in FY19.</p>	2.941	6.669	5.600	-	5.600
<p>Title: Infrastructure</p> <p>Description: Development of visualization services, data dissemination and synchronization services, repository services, initialization services, Configuration Management Database (CMDDB), and data standards.</p> <p>FY 2018 Plans: Development of visualization services, data dissemination and synchronization services, repository services, initialization services, and data standards.</p> <p>FY 2019 Base Plans:</p>	1.493	1.191	4.047	-	4.047

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EW3 / Unit Task Reorganization (UTR) Development

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Data model development, architecture and data analysis associated with NetOps Federated Repository, implementation of Identity Store Orchestration Tool, Modularization of embedded device code, deployment of Master CMDB software FY 2018 to FY 2019 Increase/Decrease Statement: Reprioritization of efforts to focus on RPS infrastructure, including but not limited to an extensible IdAM framework, development of a hardware/software licensing management framework.					
Title: System of Systems Engineering and Portfolio Management Description: Architecture, Systems Engineering Plan, Risk Management Plan, Rapid Prototyping, IPT Management, Requirements Engineering FY 2018 Plans: Architecture, Systems Engineering Plan, Risk Management Plan, Rapid Prototyping, IPT Management, Requirements Engineering FY 2019 Base Plans: Architecture, Portfolio Management Plan, Risk Management Plan, Rapid Prototyping, IPT/Working Group Management, Requirements Engineering FY 2018 to FY 2019 Increase/Decrease Statement: Leveraging PM funded efforts to maintain SoS engineering progress.	0.614	3.078	1.662	-	1.662
Title: System of Systems Program Management Description: Work Breakdown Structures, Schedules, Project Plans, Project Budgets, Quality Management Plans FY 2018 Plans: Work Breakdown Structures, Schedules, Project Plans, Project Budgets, Quality Management Plans FY 2018 to FY 2019 Increase/Decrease Statement: Alignment of effort to System of Systems Engineering/Portfolio Management in FY19.	-	1.107	-	-	-
Title: System of Systems Test and Evaluation Description: Lab based risk reduction	-	0.675	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EW3 / Unit Task Reorganization (UTR) Development

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>FY 2018 Plans: Lab based risk reduction</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: No FY19 request.</p>					
<p>Title: System of Systems Training</p> <p>Description: Development of Systems of Systems training plans.</p> <p>FY 2018 Plans: Development of Systems of Systems training plans.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: No FY19 request.</p>	-	0.311	-	-	-
Accomplishments/Planned Programs Subtotals	11.777	25.969	18.835	-	18.835

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

N/A

Remarks

D. Acquisition Strategy

Unit Task Reorganization (UTR) is the process performed by the S6 and their staff to affect change on the network in order to support the operational mission and dynamic nature of the Army. Currently network challenges exist during this process with regard to: maintaining accurate and up to date information, distributing configuration files and activating / re-establishing the network. UTR strives to make authoritative NETOPS available across all systems, reduce cognitive burden for soldiers to plan and manage the network and reduce manual touch labor.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EW3 / Unit Task Reorganization (UTR) Development
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
IP address Management	Various	Microsoft-Redmond,WA; G2-San Diego; MITRE : APG, MD	-	-		0.675		-		-		-	0.000	0.675	-
Tactical Radio Management	Various	Microsoft-Redmond,WA; G2-San Diego; MITRE : APG, MD	-	-		3.544		-		-		-	0.000	3.544	-
Cryptographic Management	Various	Microsoft-Redmond,WA; G2-San Diego; MITRE : APG, MD	-	-		1.802		-		-		-	0.000	1.802	-
Network Configuration Management	Various	Microsoft-Redmond,WA; G2-San Diego; MITRE : APG, MD	-	-		0.621		-		-		-	0.000	0.621	-
Signal Running Estimate	Various	Microsoft-Redmond,WA; G2-San Diego; MITRE : APG, MD	-	-		0.808		-		-		-	0.000	0.808	-
Network Management	Various	Microsoft-Redmond,WA; G2-San Diego; MITRE : APG, MD	-	6.541	Jul 2017	-		6.876	Nov 2018	-		6.876	Continuing	Continuing	Continuing
Network Planning	Various	Microsoft-Redmond,WA; G2-San Diego; MITRE : APG, MD	-	0.188	Jul 2017	5.488		0.650	Nov 2018	-		0.650	Continuing	Continuing	Continuing
Network Re-Establishment	Various	Microsoft-Redmond,WA; G2-San Diego; MITRE : APG, MD	-	2.941	Jul 2017	6.669		5.600	Nov 2018	-		5.600	Continuing	Continuing	Continuing
Infrastructure	Various	Microsoft-Redmond,WA; G2-	-	1.493	Jul 2017	1.191		4.047	Nov 2018	-		4.047	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604818A / Army Tactical Command & Control Hardware & Software				EW3 / Unit Task Reorganization (UTR) Development							
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
		San Diego; MITRE : APG, MD													
System of Systems Engineering And Portfolio Management	Various	MITRE; Bowhead : APG, MD	-	0.614	Jul 2017	3.078		1.662	Nov 2018	-		1.662	Continuing	Continuing	Continuing
System of Systems Program Management	Various	TBD : APG	-	-		1.107		-		-		-	0.000	1.107	-
System of Systems Training	TBD	TBD : APG	-	-		0.311		-		-		-	0.000	0.311	-
Subtotal			-	11.777		25.294		18.835		-		18.835	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems of Systems Test and Evaluation	TBD	TBD : APG	-	-		0.675		-		-		-	0.000	0.675	-
Subtotal			-	-		0.675		-		-		-	0.000	0.675	N/A
Project Cost Totals			-	11.777		25.969		18.835		-		18.835	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army

Date: February 2018

Appropriation/Budget Activity
2040 / 5

R-1 Program Element (Number/Name)
PE 0604818A / Army Tactical Command & Control Hardware & Software

Project (Number/Name)
EW3 / Unit Task Reorganization (UTR) Development

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Network Management	[Redacted]																											
Network Management																												
Password Manager Drop	1																											
Create Single UI Drop	11																											
Logging and Alerting Drop	10																											
Network Planning	[Redacted]																											
Network Planning																												
Analyze Mission Threads Drop	4																											
Crypto Planning Interface	13																											
Network Re-Establishment	[Redacted]																											
Network Re-Establishment																												
eOTAM 1.3 Fielding	7																											
eOTAM 2.0 Fielding	14																											
Infrastructure	[Redacted]																											
Infrastructure																												
NFDR OTA Award	2																											
NFDR Solution Drop	6																											

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EW3 / Unit Task Reorganization (UTR) Development

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023											
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
Data Model									8 Data Model																											
CMDB Master Drop									9 CMDB Master Drop																											
ID Store Drop									5 ID Store Drop																											
Modularize Device Code Drop									12 Modularize Device Code Drop																											
Enable Data Replication Drop									3 Enable Data Replication Drop																											
SoS Engineering and Portolio Mgmt																																				
Security Compliance Initial Drop									Security Compliance Initial Drop																											
Security Compliance Final Drop									Security Compliance Final Drop																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604818A / Army Tactical Command & Control Hardware & Software	Project (Number/Name) EW3 / Unit Task Reorganization (UTR) Development

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Network Management	3	2017	4	2023
Password Manager Drop	2	2018	2	2018
Create Single UI Drop	1	2020	1	2020
Logging and Alerting Drop	2	2019	2	2019
Network Planning	3	2017	4	2023
Analyze Mission Threads Drop	3	2018	3	2018
Crypto Planning Interface	3	2020	3	2020
Network Re-Establishment	3	2017	4	2023
eOTAM 1.3 Fielding	1	2019	1	2019
eOTAM 2.0 Fielding	3	2021	3	2021
Infrastructure	3	2017	4	2023
NFDR OTA Award	2	2018	2	2018
NFDR Solution Drop	4	2018	4	2018
Data Model	1	2019	1	2019
CMDB Master Drop	1	2019	1	2019
ID Store Drop	3	2018	3	2018
Modularize Device Code Drop	1	2020	1	2020
Enable Data Replication Drop	2	2018	2	2018
SoS Engineering and Portolio Mgmt	3	2017	4	2023
Security Compliance Initial Drop	3	2018	3	2018
Security Compliance Final Drop	1	2020	1	2020

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604820A / <i>Radar Development</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	15.368	32.968	39.338	-	39.338	91.534	96.427	80.394	43.874	0.000	399.903
E10: <i>Sentinel</i>	-	15.368	32.968	39.338	-	39.338	91.534	96.427	80.394	43.874	0.000	399.903

A. Mission Description and Budget Item Justification

This system is a component of the overall Air and Missile Defense (AMD) architecture and will provide for an incrementally fielded Integrated Air and Missile Defense Fire Control System/capability for the composite Army Air and Missile Defense Brigades. The Sentinel system is used with the Forward Area Air Defense Command and Control (FAAD C2) element and is a key component to the Integrated Air and Missile Defense (IAMDM) architecture via the IAMDM Battle Command System (IBCS) to provide critical air surveillance of the forward areas.

The Sentinel currently consists of two primary variants: the enhanced radar variant AN/MPQ-64A3 system mounted on a High Mobility Multi-purpose Wheeled Vehicle (HMMWV) and the AN/MPQ-64A3 mounted on a 2.5 ton trailer and towed by an armored Family of Medium Tactical Vehicle (FMTV) platform to meet force protection and IBCS system requirements. The fielding of the FMTV configuration AN/MPQ-64A3 assets will be complete in FY19. Sentinel also consists of Identification Friend or Foe (IFF), and Forward Area Air Defense (FAAD) Command, Control and Intelligence (C2I) interfaces. The radar is deployed in both an air defense role and a force protection role for Counter-Rocket, Artillery, and Mortar (C-RAM) missions. The sensor is an advanced three-dimensional battlefield X-Band air defense phased-array radar with an instrumented range of 75 kilometers. Sentinel is capable of operating day or night, in adverse weather conditions, in the battlefield environments of dust, smoke, aerosols and enemy countermeasures. It provides 360-degree azimuth coverage for acquisition tracking. Sentinel contributes to the digital battlefield by automatically detecting, classifying, identifying and reporting targets (cruise missiles, unmanned aerial systems, rotary wing and fixed wing aircraft). Sentinel acquires targets sufficiently forward of the battle area to allow weapons reaction time and engagement at optimum ranges. Sentinel's integrated IFF reduces the potential for fratricide of US and Coalition aircraft.

The Research and Development funding supports Sentinel modernization/upgrades, hardware/software issue resolution, resolution of obsolescence issues, engineering studies, and cost reduction initiatives. The funding for Fiscal Year (FY) 2017 through FY 2023 development activities addresses the following Sentinel system capability gaps and obsolescence issues identified by the User: 1) Target Detection gap; 2) Target Tracking gap; 3) Net Readiness gap; 4) Electronic Counter Measures (ECM) gap; 5) Unmanned Aircraft Systems (UAS) Defense gap; and 6) Rockets, Artillery & Mortars (RAM) gap.

Electronic Attack/Electronic Protect (EA/EP) addresses the electronic countermeasures (ECM) gap. This effort conducts additional design and testing to verify initial EA/EP results and updates the database and associated software and hardware with more extensive EA/EP signatures to address evolving threats. Addresses further EP modifications and methods to be determined based on analysis of results.

Signal Data Processor (SDP)/North Finding Module (NFM) addresses the Target Detection, Target Tracking, and Electronic Countermeasures (ECM) capability gaps and funds the mitigation of the SDP and NFM obsolescence issues. SDP cards are estimated to go obsolete every four to six years. Provides for new SDP kit to address obsolescence issues and allow for additional Electronic Protect capability.

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604820A / <i>Radar Development</i>	
<p>Medium Bandwidth Waveform upgrade will address latent tracking issues that currently exist with Sentinel in certain applications. This development effort modifies firmware as well as software in the Sentinel radar. This effort will provide better target resolution and more accurate tracking in the slant range coordinate. This improved target resolution and tracking accuracy will provide improved retention of target identification and more robust tracking that addresses the latent tracking issues.</p> <p>Mode S upgrade to existing Sentinel Identification Friend or Foe (IFF) will address Sentinel's objective requirement to interrogate IFF mode S which is currently not being met. Mode S transmissions are a key component of the Automatic Dependent Surveillance-Broadcast (ADS-B) surveillance technology being used by the Federal Aviation Administration for tracking aircraft as part of the Next Generation Air Transportation System (NextGen). In the United States, all aircraft required to have transponders (most aircraft) must transition to Mode S capable units by 2020. Without the Mode S upgrade, Sentinel will have to rely on these aircraft transponders responding to the legacy mode 3/A interrogations. The data available in the Mode S response will be valuable in identifying the aircraft and correlating Sentinel tracks with civil aviation tracks/data and other track data sources. Develops the Resiliency and Software Assurance Modification (RSAM) software to address the delayed Mode M Global Positioning System (GPS) capability requirement with the new interrogator.</p> <p>The Active Electronically Scanned Array (AESA) (Sentinel A4) is the next generation of radar technology to replace the current phase and frequency scanned array used by Sentinel today. The AESA Antenna will provide increased capability including extended range for ground-based surveillance and situational awareness, faster and more accurate Non-Cooperative Target Recognition (NCTR) for clearing fires and preventing fratricide, improved Fire Control (FC) quality track accuracy, and management of larger track loads. The AESA will also provide improved operation in severe/urban clutter. The system will detect and track small targets, such as Unmanned Aircraft Systems (UAS) and Cruise Missiles, in clutter and will detect and track slow targets, such as UAS and Rotary Wing (RW) aircraft, at low altitudes in clutter. The system will detect, track, and classify Rocket, Artillery, and Mortar (RAM) threats and will support Integrated Air and Missile Defense Battle Command System (IBCS) requirements and can contribute sensor support for mitigating current and future Indirect Fire Protection Capability Increment 2 mission requirements.</p> <p>Sentinel System of Systems: Software Development in support of a system of systems architecture (IAMD and IFPC Inc 2-I) for a required simulation capability. The simulation capability will add a high fidelity representation of Sentinel to IAMD to allow for optimum engagement management and mission planning. Supports Sentinel Digital Simulation Software (SDS/SENTSIM) development efforts for testing of future capabilities. Includes software development for Low Slow Small in a test fix test environment as well as integration and testing of the IAMD B kit on board the Sentinel FMTV platform.</p> <p>Adjunct sensor technology effort will integrate and test a supplemental technology for the Sentinel A3 radar to detect and identify current and emerging threats. Adjunct sensor technology compliments current radar capabilities to improve system performance and reduces adversaries countermeasure abilities by improving system electronic protect capabilities.</p>		

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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 0604820A / <i>Radar Development</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	15.983	32.968	31.761	-	31.761
Current President's Budget	15.368	32.968	39.338	-	39.338
Total Adjustments	-0.615	0.000	7.577	-	7.577
• Congressional General Reductions	-0.008	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.607	-			
• Adjustments to Budget Years	-	-	7.577	-	7.577

Change Summary Explanation

FY 2019 increase of \$7.577 Million to address Sentinel Mode S development and testing and to support the Active Electronically Scanned Array (AESA) (Sentinel A4) contract award efforts.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604820A / <i>Radar Development</i>				Project (Number/Name) E10 / <i>Sentinel</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
E10: <i>Sentinel</i>	-	15.368	32.968	39.338	-	39.338	91.534	96.427	80.394	43.874	0.000	399.903
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This system is a component of the overall Air and Missile Defense (AMD) architecture and will provide for an incrementally fielded Integrated Air and Missile Defense Fire Control System/capability for the composite Army Air and Missile Defense Brigades. The Sentinel system is used with the Forward Area Air Defense Command and Control (FAAD C2) element and is a key component to the Integrated Air and Missile Defense (IAMD) architecture via the IAMD Battle Command System (IBCS) to provide critical air surveillance of the forward areas.

The Sentinel currently consists of two primary variants: the enhanced radar variant AN/MPQ-64A3 system mounted on a High Mobility Multi-purpose Wheeled Vehicle (HMMWV) and the AN/MPQ-64A3 mounted on a 2.5 ton trailer and towed by an armored Family of Medium Tactical Vehicle (FMTV) platform to meet force protection and Integrated Air and Missile Defense Battle Command System (IBCS) system requirements. The fielding of the FMTV configuration AN/MPQ-64A3 assets will be complete in FY 2019. Sentinel also consists of Identification Friend or Foe (IFF), and Forward Area Air Defense (FAAD) Command, Control and Intelligence (C2I) interfaces. The radar is deployed in both an air defense role and a force protection role for Counter-Rocket, Artillery, and Mortar (C-RAM) missions. The sensor is an advanced three-dimensional battlefield X-Band air defense phased-array radar with an instrumented range of 75 kilometers. Sentinel is capable of operating day or night, in adverse weather conditions, in the battlefield environments of dust, smoke, aerosols and enemy countermeasures. It provides 360-degree azimuth coverage for acquisition tracking. Sentinel contributes to the digital battlefield by automatically detecting, classifying, identifying and reporting targets (cruise missiles, unmanned aerial systems, rotary wing and fixed wing aircraft). Sentinel acquires targets sufficiently forward of the battle area to allow weapons reaction time and engagement at optimum ranges. Sentinel's integrated IFF reduces the potential for fratricide of US and Coalition aircraft.

The Research and Development funding supports Sentinel modernization/upgrades, hardware/software issue resolution, resolution of obsolescence issues, engineering studies, and cost reduction initiatives. The funding for Fiscal Year (FY) 2017 through FY 2023 development activities addresses the following Sentinel system capability gaps and obsolescence issues identified by the User: 1) Target Detection gap; 2) Target Tracking gap; 3) Net Readiness gap; 4) Electronic Counter Measures (ECM) gap; 5) Unmanned Aircraft Systems (UAS) Defense gap; and 5) Rockets, Artillery & Mortars (RAM) gap.

Electronic Attack/Electronic Protect (EA/EP) addresses the electronic countermeasures (ECM) gap. This effort conducts additional design and testing to verify initial EA/EP results and updates the database and associated software and hardware with more extensive EA/EP signatures to address evolving threats. Addresses further EP modifications and methods to be determined based on analysis of results.

Signal Data Processor (SDP)/North Finding Module (NFM) addresses the Target Detection, Target Tracking, and Electronic Countermeasures (ECM) capability gaps and funds the mitigation of the SDP and NFM obsolescence issues. SDP cards are estimated to go obsolete every four to six years. Provides for new SDP kit to address obsolescence issues and allow for additional Electronic Protect capability.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604820A / <i>Radar Development</i>	Project (Number/Name) E10 / <i>Sentinel</i>
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Medium Bandwidth Waveform upgrade will address latent tracking issues that currently exist with Sentinel in certain applications. This development effort modifies firmware as well as software in the Sentinel radar. This effort will provide better target resolution and more accurate tracking in the slant range coordinate. This improved target resolution and tracking accuracy will provide improved retention of target identification and more robust tracking that addresses the latent tracking issues.

Mode S upgrade to existing Sentinel Identification Friend or Foe (IFF) will address Sentinel's objective requirement to interrogate IFF mode S which is currently not being met. Mode S transmissions are a key component of the Automatic Dependent Surveillance-Broadcast (ADS-B) surveillance technology being used by the Federal Aviation Administration for tracking aircraft as part of the Next Generation Air Transportation System (NextGen). In the United States, all aircraft required to have transponders (most aircraft) must transition to Mode S capable units by 2020. Without the Mode S upgrade, Sentinel will have to rely on these aircraft transponders responding to the legacy mode 3/A interrogations. The data available in the Mode S response will be valuable in identifying the aircraft and correlating Sentinel tracks with civil aviation tracks/data and other track data sources. Develops the Resiliency and Software Assurance Modification (RSAM) software to address the delayed Mode M Global Positioning System (GPS) capability requirement with the new interrogator.

The Active Electronically Scanned Array (AESA) (Sentinel A4) is the next generation of radar technology to replace the current phase and frequency scanned array used by Sentinel today. The AESA Antenna will provide increased capability including extended range for ground-based surveillance and situational awareness, faster and more accurate Non-Cooperative Target Recognition (NCTR) for clearing fires and preventing fratricide, improved Fire Control (FC) quality track accuracy, and management of larger track loads. The AESA will also provide improved operation in severe/urban clutter. The system will detect and track small targets, such as Unmanned Aircraft Systems (UAS) and Cruise Missiles, in clutter and will detect and track slow targets, such as UAS and Rotary Wing (RW) aircraft, at low altitudes in clutter. The system will detect, track, and classify Rocket, Artillery, and Mortar (RAM) threats and will support Integrated Air and Missile Defense Battle Command System (IBCS) requirements and can contribute sensor support for mitigating current and future Indirect Fire Protection Capability Increment 2 mission requirements.

Sentinel System of Systems: Software Development in support of a system of systems architecture (IAMD and IFPC Inc 2-I) for a required simulation capability. The simulation capability will add a high fidelity representation of Sentinel to IAMD to allow for optimum engagement management and mission planning. Supports Sentinel Digital Simulation Software (SDS/SENTSIM) development efforts for testing of future capabilities. Includes software development for Low Slow Small in a test fix test environment as well as integration and testing of the IAMD B kit on board the Sentinel FMTV platform.

Adjunct sensor technology effort will integrate and test a supplemental technology for the Sentinel A3 radar to detect and identify current and emerging threats. Adjunct sensor technology compliments current radar capabilities to improve system performance and reduces adversaries countermeasure abilities by improving system electronic protect capabilities.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	12.530	28.182	34.603	-	34.603
Description: Funding is provided for the following efforts:					
FY 2018 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604820A / Radar Development	Project (Number/Name) E10 / Sentinel
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Integrate firmware, software and hardware. Design and build prototype subsystems/components for testing. Complete software code coding and modification of the system search and track logic, clutter mapping, and waveforms. Characterize performance, design & replace firmware, software and hardware. Perform technical assessments, concept studies, cost reduction, risk reduction, threat analysis, and required documentation. Continue analysis of technology, program milestone documentation, development of contract requirement packages and proposal evaluation activities in support of Active Electronically Scanned Array (AESA) technology. Support University Affiliated Research Centers (UARC) modeling and analysis as well as lab development efforts in preparation for evaluating AESA. Support Sentinel Digital Simulation Software (SDS/ SENTSIM) development efforts for testing of future capabilities. Software development for Low Slow Small in a test fix test environment as well as integration and testing of the IAMD B kit on board the Sentinel FMTV platform.</p> <p>FY 2019 Base Plans: Integrate firmware, software and hardware. Design and build prototype subsystems/components for testing. Complete software code coding and modification of the system search and track logic, clutter mapping, and waveforms. Characterize performance, design & replace firmware, software and hardware. Perform technical assessments, concept studies, cost reduction, risk reduction, threat analysis, and required documentation. Continue analysis of technology, program milestone documentation, development of contract requirement packages and proposal evaluation activities in support of Active Electronically Scanned Array (AESA) technology. Support acquisition and contract activities for Sentinel AESA in preparation for Milestone B and contract award.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding increase from FY 2018 to FY2 019 supports contract award and milestone B activities for the Sentinel A4 as well as Mode S development efforts.</p>					
<p>Title: Test & Evaluation</p> <p>Description: Funding is provided for the following efforts:</p> <p>FY 2018 Plans: Conduct software qualification test and hardware verification testing, field testing against representative targets. Prepare logistics products and required documentation for materiel release of software and hardware upgrades. Final integration and testing of IAMD B kits on Sentinel Platform.</p> <p>FY 2019 Base Plans:</p>	1.312	4.786	4.735	-	4.735

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604820A / Radar Development	Project (Number/Name) E10 / Sentinel
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Conduct software qualification test and hardware verification testing, field testing against representative targets. Prepare logistics products and required documentation for materiel release of software and hardware upgrades.					
FY 2018 to FY 2019 Increase/Decrease Statement: Minimal funding decrease from FY 2018 to FY 2019 supports software verification and software qualification testing to be released into the field. Funding also supports Limited User Testing events.					
Title: Management Support	1.526	-	-	-	-
Description: This funds Government and technical support.					
Accomplishments/Planned Programs Subtotals	15.368	32.968	39.338	-	39.338

C. Other Program Funding Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• C53101: MSE Missile	809.201	1,106.040	871.276	260.000	1,131.276	512.775	734.152	727.032	813.280	793.430	6,627.186
• EF9: Proj EF9, System Integration and Test	61.449	78.926	79.283	-	79.283	107.785	111.124	121.376	117.336	Continuing	Continuing
• EX2: Proj EX2; Lower Tier Air Missile Defense (LTAMD) Capability	33.780	76.728	120.374	-	120.374	125.772	376.738	332.322	241.461	Continuing	Continuing
• C50016: Lower Tier Air and Missile Defense (AMD)	126.470	140.826	111.395	-	111.395	130.051	105.044	107.288	106.178	Continuing	Continuing
• DU3: Proj DU3, IFPC2 (FY12 PE0603305A IFPC II - Intercept)	-	11.303	51.030	-	51.030	146.731	132.361	156.732	21.528	Continuing	Continuing
• EY7: Proj EY7; IFPC Increment 2 - Block 1	80.781	175.069	157.710	-	157.710	77.599	32.517	-	-	0.000	523.676
• C62001: INDIRECT FIRE PROTECTION CAPABILITY, INC 2-1 Block 1 Missile 1	-	57.742	145.636	-	145.636	143.466	99.516	14.472	-	0.000	460.832
• C62002: IFPC INC 2-1 BLOCK 1 SYSTEM	-	-	0.000	-	0.000	175.576	303.422	273.802	388.377	0.000	1,141.177
• S40: Proj S40, Army Integrated Air and Missile Defense (AIAMD)	273.240	336.420	277.607	-	277.607	200.275	130.860	63.741	33.196	Continuing	Continuing
• BZ5075: IAMD Battle Command System	-	-	0.000	-	0.000	72.307	323.680	428.572	497.974	Continuing	Continuing

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604820A / Radar Development	Project (Number/Name) E10 / Sentinel
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 146: Proj 146 Air Defense C2I Eng Dev	14.987	24.306	24.326	-	24.326	14.300	8.401	2.915	1.228	0.000	90.463
• AD5070: Air & MSL Defense Planning & Control Sys	126.539	35.735	33.837	-	33.837	24.983	49.385	68.021	63.273	0.000	401.773
• 149: Proj 149; Air Defense C2I Eng Dev	24.899	4.420	1.846	-	1.846	1.277	0.909	-	-	0.000	33.351
• C62005: IFPC Inc 2-I Block 2 Missile	-	-	0.000	-	0.000	-	-	12.192	36.278	0.000	48.470

Remarks

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

D. Acquisition Strategy

Sentinel was procured from Raytheon as a non-developmental item. Raytheon owns the Technical Data Package (TDP) for the Sentinel A3 and its predecessors and therefore no other contractor has the technical ability to modify the Sentinel radar or Sentinel software. The modifications planned for the Sentinel that fall into this category are: Electronic Attack/Electronic Protect, Signal Data Processor/North Finding Module, Medium Bandwidth, and Mode S. For the Active Electronically Scanned Array, the product office will issue a new contract to develop a modified Sentinel with a new Active Electronically Scanned Array (AESA) antenna.

Electronic Attack/Electronic Protect (EA/EP) (Sentinel A3): The Sentinel Product Office will contract with Raytheon to verify the initial EA/EP Database and update the database, software and hardware with more extensive EA/EP signatures to address evolving threats. The updated database will be tested, documented and released for installation.

Signal Data Processor (SDP)/North Finding Module (NFM) Obsolescence (Sentinel A3): The Sentinel Product Office will contract with Raytheon to upgrade and mitigate the Signal Data Processor and North Finding Module issues. The updated SDP and NFM hardware will be tested, documented and released for installation in the field.

Medium Bandwidth Waveform (Sentinel A3): The Sentinel Product Office will contract with Raytheon to address latent tracking issues that currently exist with Sentinel in certain applications. The effort modifies firmware as well as software in the Sentinel radar. The updated medium bandwidth waveform software and firmware will be tested, documented and released for installation in the field.

Mode S (Sentinel A3): The Sentinel Product Office will contract with Raytheon to address Sentinel's objective requirement to interrogate Identification Friend or Foe (IFF) mode S on board commercial aircraft. The updated software will be tested, documented and released for installation in the field.

Active Electronically Scanned Array (AESA) (Sentinel A4): The Sentinel Product Office will award a new contract to develop the new AESA antenna for integration with the existing Sentinel A3 hardware and software. The CMDS Product Office will support requirement documentation and conduct design analysis to include analysis of

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army Date: February 2018

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
2040 / 5	PE 0604820A / <i>Radar Development</i>	E10 / <i>Sentinel</i>

technology, decision review preparation, and contract package development for acquisition of the AESA antenna to upgrade the current Sentinel A3. The software and hardware will be tested, documented and released for installation in the field.

Sentinel System of Systems (Sentinel A3): The Sentinel Product Office will contract with Raytheon for risk reduction efforts in the development of the software package to support the identification and engagement of Low Slow Small target sets. The Sentinel Product Office will work with Other Government Agencies to finalize integration and test of the IAMD B Kit on board the Sentinel platform and to add simulation capability to allow a high fidelity representation of Sentinel to IAMD.

Adjunct Sensor (Sentinel A3): The Sentinel Product Office will integrate and test a government off the shelf adjunct sensor. The sensor will be tested, documented and released for installation in the field.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604820A / Radar Development	Project (Number/Name) E10 / Sentinel
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Electronic Attack/ Electronic Protect	Various	Various : Multiple	-	0.425	Nov 2016	-		-		-		-	0.000	0.425	-
Signal Data Processor North Finding Module	Various	Various : Multiple	-	0.125	Nov 2016	-		-		-		-	0.000	0.125	-
Medium Bandwidth Waveform	Various	Various : Multiple	-	0.213	Nov 2016	-		-		-		-	0.000	0.213	-
Active Electronically Scanned Array (A4)	Various	Various : Multiple	-	0.549	Nov 2016	-		-		-		-	0.000	0.549	-
Management Support	Various	Various : Multiple	1.498	-		2.841	Nov 2017	2.843	Nov 2018	-		2.843	0.000	7.182	Continuing
Subtotal			1.498	1.312		2.841		2.843		-		2.843	0.000	8.494	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Electronic Attack/ Electronic Protect	Various	Raytheon & Various : Fullerton, CA / Various	4.879	3.977	Jan 2017	7.777	Jan 2018	6.188	Jan 2019	-		6.188	Continuing	Continuing	-
Signal Data Processor/ North Finding Module	Various	Raytheon & Various : Fullerton, CA / Various	3.598	1.071	Jan 2017	-		-		-		-	0.000	4.669	-
Medium Bandwidth Waveform	Various	Raytheon & Various : Fullerton, CA / Various	0.943	0.702	Jan 2017	0.222	Jan 2018	-		-		-	0.000	1.867	-
Active Electronically Scanned Array (A4)	Various	TBD & Cruise Missile Defense Systems : TBD and Huntsville, AL	-	6.780	Jan 2017	12.024	Jan 2018	21.113	May 2019	-		21.113	Continuing	Continuing	-
System of Systems	Various	Raytheon & Various : Fullerton, CA / Various	-	-		4.900	Jan 2018	-		-		-	0.000	4.900	-
Mode S	Various	Raytheon & Various : Fullerton, CA / Various	-	-		1.838	Jan 2018	5.723	Jan 2019	-		5.723	Continuing	Continuing	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604820A / Radar Development	Project (Number/Name) E10 / Sentinel
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			9.420	12.530		26.761		33.024		-		33.024	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Electronic Attack/ Electronic Protect	Various	Raytheon & Various : Fullerton, CA / Various	0.463	0.857	Jan 2017	1.138	Jan 2018	1.501	Jan 2019	-		1.501	Continuing	Continuing	-
Signal Data Processor North Finding Module	Various	Raytheon & Various : Fullerton, CA / Various	0.781	0.324	Jan 2017	-		-		-		-	0.000	1.105	-
Medium Bandwidth Waveform	Various	Raytheon & Various : Fullerton, CA / Various	0.278	0.345	Jan 2017	0.151	Jan 2018	-		-		-	0.000	0.774	-
System of Systems	Various	Raytheon & Various : Fullerton, CA / Various	-	-		1.561	Jan 2018	-		-		-	0.000	1.561	-
Mode S	Various	Raytheon & Various : Fullerton, CA / Various	-	-		0.516	Jan 2018	1.970	Jan 2019	-		1.970	Continuing	Continuing	-
Subtotal			1.522	1.526		3.366		3.471		-		3.471	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		12.440	15.368	32.968	39.338	-	39.338	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604820A / <i>Radar Development</i>	Project (Number/Name) E10 / <i>Sentinel</i>
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Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Electronic Attack/Electronic Protect (EA/EP)																												
EA/EP																												
Signal Data Processor (SDP) / North Finding Module (NFM)																												
SDP/NFM																												
Medium Bandwidth																												
Med Bdwth																												
System of Systems																												
System of Systems																												
Mode S																												
Mode S																												
Active Electronically Scanned Array (AESA) (A4)																												
AESA																												
Adjunct Sensor																												
Adjunct Sensor																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604820A / <i>Radar Development</i>	Project (Number/Name) E10 / <i>Sentinel</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Electronic Attack/Electronic Protect (EA/EP)	2	2015	4	2023
Signal Data Processor (SDP) / North Finding Module (NFM)	2	2015	4	2017
Medium Bandwidth	2	2016	4	2018
System of Systems	2	2018	4	2018
Mode S	2	2018	4	2020
Active Electronically Scanned Array (AESA) (A4)	1	2017	4	2033
Adjunct Sensor	2	2021	4	2022

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>					R-1 Program Element (Number/Name) PE 0604822A / <i>General Fund Enterprise Business System (GFEBS)</i>							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	11.044	49.554	37.851	-	37.851	35.699	36.598	41.979	55.900	0.000	268.625
DV6: <i>General Fund Enterprise Business System</i>	-	11.044	39.554	35.301	-	35.301	32.282	17.601	3.289	0.000	0.000	139.071
EV4: <i>General Fund Enterprise Business System Inc 2</i>	-	0.000	0.000	0.995	-	0.995	1.814	17.344	36.961	54.266	0.000	111.380
GF5: <i>General Fund Enterprise Business System</i>	-	0.000	10.000	1.555	-	1.555	1.603	1.653	1.729	1.634	0.000	18.174

Note

Effective February 2, 2017 DoD Instruction (DoDI) 5000.75 was issued to establish policy for use of Business Capability Acquisition Cycle (BCAC) for Defense Business Systems, applying to the General Fund Enterprise Business System (GFEBS). This DoDI supersedes DoDI 5000.02, improving the alignment of business systems to commercial best practices as well as optimizing efficiencies and effectiveness across DoD for the acquisition of business systems. Decisions rendered by the Milestone Decision Authority, as outlined in DoDI 5000.75, are referred to as "Authority To Proceed (ATPs)" and replace DoDI 5000.02 "Milestones."

A. Mission Description and Budget Item Justification

DV6 - General Fund Enterprise Business System-Sensitive Activities (GFEBS-SA): GFEBS-SA is a designated National Security System (NSS) and is leveraging the GFEBS base system that is a commercial off-the-shelf Enterprise Resource Planning System certified by the Chief Financial Officers Council. The GFEBS base system has reached Full Deployment and is currently in sustainment. The Army still has classified and sensitive financial activity remaining in legacy systems that cannot be processed in the fully-fielded GFEBS system; therefore, GFEBS-SA is an essential financial program designed to enable the auditability that is needed to comply with the Chief Financial Officers (CFO) Act and the Federal Financial Management Improvement Act (FFMIA), and prevent compromise of data that could cause grave harm to U.S. forces. To protect sensitive information and enable clean auditability, the Army requires a separate instance of GFEBS operated on a secure network for processing sensitive and classified financial transactions. GFEBS-SA will integrate with GFEBS to provide secure, web-based financial execution and reporting capabilities for the Army's classified and sensitive activities. GFEBS-SA is envisioned as a fully functional GFEBS application operated on a secure network (SIPRNET), leveraging off of the sustained system design and implementation that includes additional performance requirements designed to protect sensitive intelligence operations and special operations missions. It will process Secret Collateral and below information while providing GFEBS capabilities such as distribution and execution of appropriated funds, cost management, financial reporting, and asset management. GFEBS-SA will be implemented and deployed to 3,000 users across 100 locations worldwide. GFEBS-SA will support information exchanges with organizations that support the Army's sensitive activities mission, including cross-security domain integration between SIPRNet and NIPRNet with GFEBS and other system partners. Services will be capable of being upgraded throughout the life of the program in order to incorporate advances in best business practices and technology. The funding requested in FY19 supports continued system development in order to allow communication to other systems supporting the auditability of classified financial data, system hosting in the DISA environment, testing, and pre-deployment activities. Overall, the RDT&E funding in FY19 supports the transition from development to deployment of the GFEBS-SA effort.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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 0604822A / <i>General Fund Enterprise Business System (GFEBS)</i>
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EV4 - General Fund Enterprise Business System Increment II (GFEBS Inc II): GFEBS Increment II is in support of the Army's Standard Labor Time Tracking (SLTT) Problem Statement approved by the Office of the Secretary Defense (OSD). The program plans to use an enterprise approach for development and deployment consisting of GFEBS, Army Enterprise Systems Integration Program (AESIP), Global Combat Support System Army (GCSS-A), and Logistics Modernization Program (LMP). SLTT is designed to expand on the time and attendance from supporting payroll processing to enable labor tracking for cost of products/services. Currently, the program is repositioning due to funding being reprogrammed to fund higher priority efforts. Two of the original three GFEBS Increment II requirements [Integrated Resource Management (IRM) & Enhanced Financial Integration (EFI)] have been merged into the GFEBS baseline based on a new acquisition approach in accordance with the DoD 5000.75; until a program office is designated as the Office of Primary Responsibility (OPR), GFEBS will request funding for the remaining requirement (Standard Labor Time Tracking [SLTT]) through the Program Objective Memorandum (POM).

GF5 - General Fund Business Enterprise System (GFEBS): GFEBS is a Major Automated Information System (MAIS) program currently in the sustainment phase. It follows the DoD Business Enterprise Architecture which is aligned to the mandated Federal Enterprise Architecture. GFEBS was implemented to fulfill the needs and comply with the Federal Financial Management Improvement Act, The Chief Financial Officers Act of 1990, the Government Performance and Results Act of 1993, the Government Management Reform Act of 1994, the Clinger-Cohen Act of 1996, and to fulfill the stated mission of the Assistant Secretary of the Army for Financial Management and Comptroller. GFEBS subsumed the capabilities, in full or in part, of financial systems operating in excess of 40 years including the Standard Finance System and other costly feeder systems which do not allow the Department of Defense or the U.S. government to achieve an unqualified audit opinion on its financial statements. GFEBS is used to administer the Army's General Fund. GFEBS was developed using a commercial off-the-shelf Enterprise Resource Planning system that is certified by the Chief, Financial Officer Council and provides six core financial functions (United States General Ledger (USGL), Cost Management, Funds Control, Payable Management, Real Property, Receivable Management and Reports). GFEBS allows tactical commanders to make informed decisions with virtually real time information. On 1 October 2008, GFEBS deployed Wave 1 to end users at Fort Jackson Garrison, Defense Finance Accounting Service (DFAS) Indianapolis, and several other organizations. The Full Deployment Decision was received by the Milestone Decision Authority on 24 June 2011, and Full Deployment was achieved on 1 July 2012. Current efforts include sustaining the system and infrastructure, making modifications needed for audit readiness, compliancy, and upgrades required to maintain the system and meet SAP standards. Additionally, GFEBS continues to make changes as requested by the user community through the Process Owners Group; an SES and General Officers level board that prioritizes user needs. Some of these changes require RDT&E funding.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	6.805	49.554	36.931	-	36.931
Current President's Budget	11.044	49.554	37.851	-	37.851
Total Adjustments	4.239	0.000	0.920	-	0.920
• Congressional General Reductions	-0.003	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	4.500	-			
• SBIR/STTR Transfer	-0.258	-			
• Adjustments to Budget Years	-	-	0.920	-	0.920

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

Appropriation/Budget Activity
2040: *Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)*

R-1 Program Element (Number/Name)
PE 0604822A / *General Fund Enterprise Business System (GFEBS)*

Change Summary Explanation

For FY 2019, the \$920K increase from the previous President's Budget is based on findings from a Preliminary Design Review (PDR) which increases requirements due to the complexity of interfacing with the classified environment.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604822A / General Fund Enterprise Business System (GFEBS)				Project (Number/Name) DV6 / General Fund Enterprise Business System			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DV6: General Fund Enterprise Business System	-	11.044	39.554	35.301	-	35.301	32.282	17.601	3.289	0.000	0.000	139.071
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Project DV6 is General Fund Enterprise Business System - Sensitive Activities (GFEBS-SA).

A. Mission Description and Budget Item Justification

DV6 - General Fund Enterprise Business System-Sensitive Activities (GFEBS-SA): GFEBS-SA is a designated National Security System (NSS) and is leveraging the GFEBS base system that is a commercial off-the-shelf Enterprise Resource Planning System certified by the Chief Financial Officers Council. The GFEBS base system has reached Full Deployment and is currently in sustainment. The Army still has classified and sensitive financial activity remaining in legacy systems that cannot be processed in the fully-fielded GFEBS system; therefore, GFEBS-SA is an essential financial program designed to enable the auditability that is needed to comply with the Chief Financial Officers (CFO) Act and the Federal Financial Management Improvement Act (FFMIA), and prevent compromise of data that could cause grave harm to U.S. forces. To protect sensitive information and enable clean auditability, the Army requires a separate instance of GFEBS operated on a secure network for processing sensitive and classified financial transactions. GFEBS-SA will integrate with GFEBS to provide secure, web-based financial execution and reporting capabilities for the Army's classified and sensitive activities. GFEBS-SA is envisioned as a fully functional GFEBS application operated on a secure network (SIPRNET), leveraging off of the sustained system design and implementation that includes additional performance requirements designed to protect sensitive intelligence operations and special operations missions. It will process Secret Collateral and below information while providing GFEBS capabilities such as distribution and execution of appropriated funds, cost management, financial reporting, and asset management. GFEBS-SA will be implemented and deployed to 3,000 users across 100 locations worldwide. GFEBS-SA will support information exchanges with organizations that support the Army's sensitive activities mission, including cross-security domain integration between SIPRNet and NIPRNet with GFEBS and other system partners. Services will be capable of being upgraded throughout the life of the program in order to incorporate advances in best business practices and technology.

The funding requested in FY19 supports continued system development in order to allow communication to other systems supporting the auditability of classified financial data, system hosting in the DISA environment, testing, and pre-deployment activities. Overall, the RDT&E funding in FY19 supports the transition from development to deployment of the GFEBS-SA effort.

BACKGROUND: Initial implementation of the GFEBS-SA project did not require development funds beyond FY16. However, based on a detailed analysis of the original System Integrator, an Army determination was made that they could not deliver a solution to meet the GFEBS-SA requirement. The program was restructured with an Acquisition Decision Memorandum (ADM) on 9 September 2016 in alignment with an Army-validated Operational Needs Statement (ONS). A new System Integrator contract began work on 1 May 2017 with a schedule that supports the Army's timeline; minimizing operational risks to the Army's sensitive activity commands.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604822A / <i>General Fund Enterprise Business System (GFEBS)</i>	Project (Number/Name) DV6 / <i>General Fund Enterprise Business System</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>Title: Software Development</p> <p>Description: Software development includes all RDT&E activities related to the development and hosting of the GFEBS-SA system itself.</p> <p>NOTE: FY19 RDT&E activities are separated into more defined buckets than in previous years to give more insight into program requirements.</p> <p>FY 2018 Plans: Funds in FY 2018 are required to support system development to include: System Integrator labor, interface development, DISA development and hosting, initial test activities, training equipment and tools, and pre-deployment site surveys. Additionally, FY 2018 funding supports Program Office costs including System Engineering tools, RMF/Cyber Security support, Support Contract Labor, system interfaces, and DISA Cross Domain Solution development.</p> <p>FY 2019 Plans: FY19 funding supports the software development of the GFEBS-SA product; development of interfaces with partners involved in auditability of classified financial information; system engineering, planning, and analysis; establishment and hosting costs in the DISA environment; cybersecurity support; and pre-deployment planning activities.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY19 RDTE funding levels will be less than FY18 because a majority of development efforts for GFEBS-SA will be accomplished in FY18 as the system shifts towards more interface development and deployment-focused activities in FY19.</p>		11.044	39.554	27.677
<p>Title: Testing</p> <p>Description: Testing includes all efforts related to test planning, Developmental Testing (DT), User Acceptance Testing (UAT), Operations Test & Evaluation (OT&E), and evaluation and site services aligned with each.</p> <p>NOTE: FY19 RDT&E activities are separated into more defined buckets than in previous years to give more insight into program requirements.</p> <p>FY 2019 Plans: FY19 testing support includes test planning activities for the Developmental Test and User Acceptance Test, as well as funding for external services such as the Joint Interoperability Test Command (JITC).</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p>		-	-	0.960

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604822A / General Fund Enterprise Business System (GFEBS)	Project (Number/Name) DV6 / General Fund Enterprise Business System

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Test planning for GFEBS-SA begins in FY19. There are no formal test activities scheduled before FY19.			
Title: Program Support	-	-	6.664
Description: Program Support includes all activities within the program office. Costs include government management; government technical support; facilities; system engineering and program management tools associated with program execution (i.e., logistics software, program management database and tracking tools, office software, etc.); and support contractors who provide technical expertise, day-to-day program execution, and acquisition support.			
FY 2019 Plans: FY19 Program Support includes all activities within the program office. Costs include government management; government technical support; facilities; system engineering and program management tools associated with program execution (i.e., logistics software, program management database and tracking tools, office software, etc.); and support contractors who provide technical expertise, day-to-day program execution, and acquisition support.			
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 Program Support has been operating at similar levels in previous years; however, those activities have been separated into a separate bucket for this submission to give more insight into program requirements.			
Accomplishments/Planned Programs Subtotals	11.044	39.554	35.301

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• B55511: GFEBS-SA	-	-	6.424	-	6.424	6.248	5.369	-	-	0.000	18.041

Remarks
Procurement dollars for GFEBS-SA will be used for Organizational Change Management System Integrator/Government/Functional roadshows, SAP HANA licenses (for system access and data storage), on-site support, user training, and deployment to all users.

GFEBS-SA OMA requirements are minimal in FY19, and will be covered under the base program. Requirements after FY19 have been incorporated into the FY20-FY24 POM request.

D. Acquisition Strategy
Plan, develop, and manage GFEBS-SA as a separate instance from GFEBS base program on the SIPRNet to support delivery of capabilities for this designated National Security System (NSS) in support of the sensitive activity commands. The GFEBS-SA solution will be acquired as a sole source contract with Accenture Federal Services as a single increment. The contract will be a hybrid of Firm Fixed Price, Cost Plus Incentive Fee, and Cost Plus Fixed Fee CLINs to support development

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604822A / <i>General Fund Enterprise Business System (GFEBS)</i>	Project (Number/Name) DV6 / <i>General Fund Enterprise Business System</i>
<p>efforts and to encourage Accenture Federal Services to deliver a solution in support of the Vice Chief of Staff of the Army recommendation to accelerate the schedule to ensure operational security and Army audit requirements. The contract was awarded in April 2017.</p> <p>Software will be developed through a single build to achieve full capability. GFEBS-SA will consist of a single release delivered in a limited deployment (size not capability) to the Initial Operational Test and Evaluation (IOT&E) unit, followed by a full deployment to all other users upon successful completion of IOT&E.</p> <p>The program will require continuous process and product improvements after full deployment. These continuous process and product improvements will require a stream of RDT&E funding to keep the GFEBS-SA system synchronized with the base system by making modifications needed for audit readiness, compliancy, and upgrades required to keep the system up-to-date with SAP standards and Functional Governance Board requirements.</p> <p>E. Performance Metrics N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604822A / General Fund Enterprise Business System (GFEBS)	Project (Number/Name) DV6 / General Fund Enterprise Business System
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Product Development	SS/CPIF	Accenture Federal LLC : Alexandria, VA	-	11.044	Apr 2017	27.014	Apr 2018	27.677	Oct 2018	-		27.677	22.565	88.300	88.300
Subtotal			-	11.044		27.014		27.677		-		27.677	22.565	88.300	N/A

Remarks
The contract is a hybrid made up on multiple types of CLINs; however, the majority of CLINs are CPIF based on the nature of the work performed.

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Support Costs	Various	PdM GFEBS SA : Arlington, VA	14.641	-		12.327	Oct 2017	6.664	Oct 2018	-		6.664	24.752	58.384	-
Subtotal			14.641	-		12.327		6.664		-		6.664	24.752	58.384	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Testing	IA	JITC/A TEC : Alexandria, VA	4.960	-		0.213	Jan 2018	0.960	Oct 2018	-		0.960	5.855	11.988	-
Subtotal			4.960	-		0.213		0.960		-		0.960	5.855	11.988	N/A

Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	19.601	11.044	39.554	35.301	35.301	53.172	158.672	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604822A / <i>General Fund Enterprise Business System (GFEBS)</i>	Project (Number/Name) DV6 / <i>General Fund Enterprise Business System</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Program Management	[Redacted]																[Redacted]				[Redacted]							
Development	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Test Planning	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Testing	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Deployment	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Continuous Process & Product Improvements	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Milestone B (ATP 3)	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Initial Operating Capability (IOC)	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Full Deployment (FD)	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
License Procurement	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Sustainment	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604822A / <i>General Fund Enterprise Business System (GFEBS)</i>	Project (Number/Name) DV6 / <i>General Fund Enterprise Business System</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Program Management	1	2015	2	2021
Development	3	2017	4	2019
Test Planning	1	2019	4	2019
Testing	3	2019	2	2020
Deployment	1	2020	2	2021
Continuous Process & Product Improvements	2	2021	4	2024
Milestone B (ATP 3)	2	2018	2	2018
Initial Operating Capabiity (IOC)	2	2020	2	2020
Full Deployment (FD)	2	2021	2	2021
License Procurement	1	2019	2	2021
Sustainment	2	2021	4	2024

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

Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604822A / General Fund Enterprise Business System (GFEBS)				Project (Number/Name) EV4 / General Fund Enterprise Business System Inc 2			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EV4: General Fund Enterprise Business System Inc 2	-	0.000	0.000	0.995	-	0.995	1.814	17.344	36.961	54.266	0.000	111.380
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

GFEBS Increment II is in support of the Army's Standard Labor Time Tracking (SLTT) Problem Statement approved by the Office of the Secretary Defense (OSD). The program plans to use an enterprise approach for development and deployment consisting of GFEBS, Army Enterprise Systems Integration Program (AESIP), Global Combat Support System Army (GCSS-A), and Logistics Modernization Program (LMP). SLTT is designed to expand on the time and attendance from supporting payroll processing to enable labor tracking for cost of products/services. Labor costs account for over 60% of the Army budget and currently there is no standard process or materiel solution to enable the capture and analytical review of the information. This effort will eliminate redundant labor tracking systems, increase efficiencies, ensure the workforce is the right size and mix, and will be financially auditable. These labor hours will be accurate and the costs associated with this labor will be mapped in a timely manner (especially since some Army organizations are fully reimbursable). By doing this, the Army can terminate other time tracking systems or processes currently being used. Furthermore, it will support the audibility of reimbursable intra-Army work.

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

	FY 2017	FY 2018	FY 2019
Title: GFEBS Increment II Acquisition Planning	-	-	0.995
Description: Program is repositioning due to funding being reprogrammed to fund higher priority efforts. Two of the three GFEBS Increment II requirements [Integrated Resource Management (IRM) & Enhanced Financial Integration (EFI)] have been merged into the GFEBS baseline based on a new acquisition approach in accordance with the DoD 5000.75; until a program office is designated as the Office of Primary Responsibility (OPR), GFEBS will request funding for the remaining requirement (Standard Labor Time Tracking [SLTT]) through the Program Objective Memorandum (POM).			
FY 2019 Plans: FY 2019 funding will fund the GFEBS Increment II PMO team to continue program acquisition planning and documentation.			
FY 2018 to FY 2019 Increase/Decrease Statement: GFEBS Increment II requirements were put on hold in FY18 in order to fund GFEBS-SA, which was designated as a higher priority by the Vice Chief of Staff of the Army (VCSA). Originally allocated FY18 funds were reprogrammed, and the FY19 allocation is meant to continue acquisition planning with key PMO staff.			
Accomplishments/Planned Programs Subtotals	-	-	0.995

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

N/A

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604822A / <i>General Fund Enterprise Business System (GFEBS)</i>	Project (Number/Name) EV4 / <i>General Fund Enterprise Business System Inc 2</i>

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

Remarks

N/A

D. Acquisition Strategy

In FY 2019 the PMO will participate in a robust update of the requirements definitions, a comprehensive analysis of alternatives, initial business process design activities with the functional community, and will prepare the required acquisition documentation to achieve authorization to proceed with acquiring the required capabilities.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604822A / General Fund Enterprise Business System (GFEBS)	Project (Number/Name) EV4 / General Fund Enterprise Business System Inc 2
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Support Costs	SS/ Various	GFEBS Increment II PMO : Arlington, VA	-	-		-		0.995		-		0.995	0.000	0.995	-
Subtotal			-	-		-		0.995		-		0.995	0.000	0.995	N/A

Remarks
Not contract support

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	0.000	0.995	-	0.995	0.000	0.995	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604822A / <i>General Fund Enterprise Business System (GFEBS)</i>	Project (Number/Name) EV4 / <i>General Fund Enterprise Business System Inc 2</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Material Solution Analysis					Material Solution Analysis																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604822A / <i>General Fund Enterprise Business System (GFEBS)</i>	Project (Number/Name) EV4 / <i>General Fund Enterprise Business System Inc 2</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Material Solution Analysis	1	2018	4	2020

Note

Program is repositioning due to funding being reprogrammed to fund higher priority efforts. Two of the three GFEBS Increment II requirements [Integrated Resource Management (IRM) & Enhanced Financial Integration (EFI)] have been merged into the GFEBS baseline based on a new acquisition approach in accordance with the DoD 5000.75; until a program office is designated as the Office of Primary Responsibility (OPR), GFEBS will request funding for the remaining requirement (Standard Labor Time Tracking [SLTT]) through the Program Objective Memorandum (POM).

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604822A / General Fund Enterprise Business System (GFEBS)				Project (Number/Name) GF5 / General Fund Enterprise Business System			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
GF5: General Fund Enterprise Business System	-	0.000	10.000	1.555	-	1.555	1.603	1.653	1.729	1.634	0.000	18.174
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

GFEBS is a Major Automated Information System (MAIS) program currently in the sustainment phase. It follows the DoD Business Enterprise Architecture which is aligned to the mandated Federal Enterprise Architecture. GFEBS was implemented to fulfill the needs and comply with the Federal Financial Management Improvement Act, The Chief Financial Officers Act of 1990, the Government Performance and Results Act of 1993, the Government Management Reform Act of 1994, the Clinger-Cohen Act of 1996, and to fulfill the stated mission of the Assistant Secretary of the Army for Financial Management and Comptroller. GFEBS subsumed the capabilities, in full or in part, of financial systems operating in excess of 40 years, including the Standard Finance System and other costly feeder systems which do not allow the Department of Defense or the U.S. government to achieve an unqualified audit opinion on its financial statements. GFEBS is used to administer the Army's General Fund. GFEBS was developed using a commercial off-the-shelf Enterprise Resource Planning system that is certified by the Chief, Financial Officer Council and provides six core financial functions (United States General Ledger (USGL), Cost Management, Funds Control, Payable Management, Real Property, Receivable Management and Reports). GFEBS allows tactical commanders to make informed decisions with virtually real time information. On 1 October 2008, GFEBS deployed Wave 1 to end users at Fort Jackson Garrison, Defense Finance Accounting Service (DFAS) Indianapolis, and several other organizations. The Full Deployment Decision was received by the Milestone Decision Authority on 24 June 2011, and Full Deployment was achieved on 1 July 2012. Current efforts include sustaining the system and infrastructure, making modifications needed for audit readiness, compliancy, and upgrades required to maintain the system and meet SAP standards. Additionally, GFEBS continues to make changes as requested by the user community through the Process Owners Group; an SES and General Officers level board that prioritizes user needs. Some of these changes require developmental funding.

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

	FY 2017	FY 2018	FY 2019
Title: Capability Enhancement	-	10.000	1.555
Description: Major changes to the system needed to update the infrastructure as required to meet SAP requirements and best practices, and to support evolving statutory and regulatory requirements. The capability enhancement initiatives are needed to increase the GFEBS capability and performance to maintain compliance with Federal Financial Management Improvement Act (FFMIA), Business Enterprise Agency (BEA), Standard Financial Information Structure (SFIS) requirements, and auditability.			
FY 2018 Plans: FY 2018 RDTE funding supports the enhancements requested by the Financial Integration Process Owners Group, as well as enhancements and new capabilities related to audit, compliance, and legacy system retirement.			
FY 2019 Plans:			

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604822A / <i>General Fund Enterprise Business System (GFEBS)</i>	Project (Number/Name) GF5 / <i>General Fund Enterprise Business System</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
FY 2019 RDTE funding supports the enhancements requested by the Financial Integration Process Owners Group, as well as enhancements and new capabilities related to audit, compliance, and legacy system retirement.			
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Adjustment to support higher priorities.			
Accomplishments/Planned Programs Subtotals	-	10.000	1.555

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• BE4168: <i>GFEBS</i>	6.416	4.465	4.552	-	4.552	4.554	4.399	4.516	4.602	0.000	33.504

Remarks
 FY 2019 Procurement dollars in the amount of \$4.554 million supports software and hardware infrastructure upgrades to bring GFEBS reporting and analytics in-line with processing performance thresholds established in the GFEBS Capabilities Production Document (CPD). Software upgrades support auditability and compliancy requirements, to maintain the system to required software standards.

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604822A / General Fund Enterprise Business System (GFEBS)	Project (Number/Name) GF5 / General Fund Enterprise Business System
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Development	Option/TBD	TBD : TBD	120.968	-		10.000		1.555		-		1.555	Continuing	Continuing	-
HQAES Integration	C/FFP	VAR : VAR	14.118	-		-		-		-		-	0.000	14.118	-
Subtotal			135.086	-		10.000		1.555		-		1.555	Continuing	Continuing	N/A
Project Cost Totals			135.086	-		10.000		1.555		-		1.555	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604822A / General Fund Enterprise Business System (GFEBS)	Project (Number/Name) GF5 / General Fund Enterprise Business System	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Sustainment Development Task Order Award	1																											
Capability Enhancements FY18					Capability Enhancements																							
Capability Enhancements FY19									Capability Enhancements																			
Capability Enhancements FY20													Capability Enhancements															
Capability Enhancements FY21																	Capability Enhancements											
Capability Enhancements FY22																					Capability Enhancements							
Capability Enhancements FY23																									Capability Enhancements			
Capability Enhancements FY24																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604822A / <i>General Fund Enterprise Business System (GFEBS)</i>	Project (Number/Name) GF5 / <i>General Fund Enterprise Business System</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Map/Blueprint/Build Release 1.1	4	2005	3	2006
Realization - Release 1.2	4	2006	1	2009
IOC	3	2009	3	2009
Release 1.3 - Replace STANFINS	1	2008	1	2011
Full Deployment Decision Review	3	2009	3	2009
Release 1.4: Replace SOMARDS	4	2008	1	2011
Full Deployment Decision Review 2	1	2010	1	2010
Hardware Fielding	1	2009	1	2011
Sustainment Development Task Order Award	1	2017	1	2017
Capability Enhancements FY18	1	2018	4	2018
Capability Enhancements FY19	1	2019	4	2019
Capability Enhancements FY20	1	2020	4	2020
Capability Enhancements FY21	1	2021	4	2021
Capability Enhancements FY22	1	2022	4	2022
Capability Enhancements FY23	1	2023	4	2023
Capability Enhancements FY24	1	2024	4	2024

Note

Sustainment contract awarded in December 2016; protests have been resolved and transition-in is set to begin January 2018.

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604823A / Firefinder
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	6.177	45.605	45.473	-	45.473	48.745	49.874	48.167	49.479	0.000	293.520
L86: LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)	-	3.064	2.136	4.194	-	4.194	4.913	5.379	3.459	4.288	0.000	27.433
L87: Hypervelocity Armament System (HAS)	-	0.000	36.000	35.617	-	35.617	35.587	35.581	35.576	35.567	0.000	213.928
L88: Enhanced AN/TPQ 36	-	3.113	7.469	5.662	-	5.662	8.245	8.914	9.132	9.624	0.000	52.159

A. Mission Description and Budget Item Justification

This program funds design, development and test of primary target acquisition and counterfire radars to automatically detect, locate and classify hostile indirect fire weapons (mortars, artillery, and rockets). The program directly supports the prioritization, tracking and locating of targets, and dissemination of that information for simultaneous attack of multiple threats. It provides the Warfighter with continuous and responsive counterfire target acquisition systems for all types and phases of military operations. Project L86, Lightweight Counter Mortar Radar (LCMR), version AN/TPQ-50 provides 360 degrees of azimuth coverage from ranges of 500 meters to 10 kilometers. The AN/TPQ-50 and AN/TPQ-53 radars are currently fielded to multiple Continental United States (CONUS) and Outside Continental United States (OCONUS) locations to include operational support to Operation Inherent Resolve (OIR) and Operation Freedom's Sentinel (OFS). Project L88, AN/TPQ-53 is a highly mobile radar system that leverages the latest in technology design to accelerate technology infusion and increase range while improving false location rate, reducing obsolescence and increasing reliability. The AN/TPQ-53 provides a system with increased range and accuracy throughout a 90 degree search sector (stare mode) as well as 360 degree coverage (rotating) for locating mortar, artillery and rocket firing positions.

The Fiscal Year FY 2019 Base funding in the amount of \$9.856 million will support ongoing AN/TPQ-53 test efforts and Army interoperability certifications (AICs), AN/TPQ-50 and AN/TPQ-53 development and testing of modernization efforts for electronic protection and new and emerging threats as well as the performance of technical assessments, concept studies, risk reduction and required documentation.

Starting in FY 2019, program office core employee labor costs have been moved from RDTE to OMA as part of an OSD auditability directive.

This program line also funds development of an integrated Hypervelocity Armament System (HAS), and associated technologies as they mature to support accelerated demonstration and transition of advanced gun weapon systems, command guided maneuverable projectiles, and tactical sensors. The development of HAS would include advancing artillery powder guns firing Hypervelocity Projectiles (HVPs), resulting in next-generation, common, low drag, guided cannon artillery projectiles capable of completing multiple missions with improved cost effectiveness across different gun systems. Integration with a fire control radar and sensor array will allow closed-loop targeting of moving and relocatable targets beyond the range of conventional artillery. Current estimates for follow on development efforts achieve transitionable technology solutions by FY 2023.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>
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Fiscal Year FY 2019 Base funding in the amount of \$35.617 million will support the continued initiation of accelerated transition planning, contract requirements package development, system evaluation, requirements/specification work, integration development and test plans for the Hypervelocity Armament System. The Army will leverage Strategic Capabilities Office (SCO) prototypes and technologies to continue transition from the FY 2018 program into programs of record.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	9.235	45.605	47.023	-	47.023
Current President's Budget	6.177	45.605	45.473	-	45.473
Total Adjustments	-3.058	0.000	-1.550	-	-1.550
• Congressional General Reductions	-0.004	-			
• Congressional Directed Reductions	-2.810	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.244	-			
• Other Adjustments 3	-	-	-1.550	-	-1.550

Change Summary Explanation

FY 2017 Congressional General Reduction of \$0.004 million is for FFRDC for both Lightweight Counter Mortar Radar (LCMR) and Enhanced AN/TPQ-36 (\$0.002 million per program).

FY 2017 Congressional Directed Reduction of \$2.810 million for Enhanced AN/TPQ-36 carryover.

FY 2017 SBIR/STTR Transfer is split between LCMR (\$0.121 million) Enhanced AN/TPQ-36 (\$0.123 million).

FY 2019 Other Adjustments 3 reflects the following decreases:

*LCMR - \$0.167 million

*Hypervelocity Armament System (HAS) - \$0.383 million

*Enhanced AN/TPQ-36 - \$1.122 million

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>				Project (Number/Name) L86 / <i>LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
L86: <i>LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)</i>	-	3.064	2.136	4.194	-	4.194	4.913	5.379	3.459	4.288	0.000	27.433
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AN/TPQ-50 Lightweight Counter Mortar Radar (LCMR) is a highly mobile radar that automatically detects, classifies, tracks, and locates the point of origin of projectiles fired from mortar, artillery, and rocket systems with sufficient accuracy for first round fire for effect. It mitigates close combat radar coverage gaps by providing 360 degrees of azimuth coverage from ranges of 500 meters to 10 kilometers and is capable of being deployed in two configurations, standalone or vehicle mounted. The AN/TPQ-50 system interoperates with mission command systems (MCSs) to provide the maneuver commander increased counterfire radar flexibility. The AN/TPQ-50 is deployed as part of the Counter-Rocket, Artillery, Mortar (C-RAM) system of systems. It provides data to the Forward Area Air Defense Command and Control (FAAD C2) node for the sense and warn force protection capability. The AN/TPQ-50 is currently fielded to multiple Continental United States (CONUS) and Outside Continental United States (OCONUS) locations to include support to Operation Inherent Resolve (OIR) and Operation Freedom's Sentinel (OFS).

The Fiscal Year (FY) 2019 Research, Development, Test and Evaluation (RDTE) funds of \$4.194 million will continue the work required to enhance the AN/TPQ-50's capability to address electronic protection against cyber electromagnetic activity (CEMA) and other known, new, emerging and evolving threats identified in the System Threat Assessment Report (STAR). This effort will develop and integrate sensor protect capabilities into the software baseline, develop advanced protection techniques which take advantage of hardware upgrades, and develop documentation for hardware and software capability improvements. Funding supports all associated testing costs and program support.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Electronic Protection	0.797	-	-	-	-
Description: The effort develops spectrum management techniques, mitigates electromagnetic interference (EMI) from commercial and military bands in addition to hostile EMI, and improves signal processor protection algorithms to defeat radar targeting armaments.					
Title: Modernization & New and Emerging Threats	2.267	2.136	4.194	-	4.194
Description: Program modernization effort which completes the development of hardware kits and develops advanced electronic protection techniques via software to combat CEMA. This effort funds the development of capabilities to address vulnerabilities identified in the bi-annual release of the STAR and changes on the battlefield due to new tactics, techniques, procedures (TTPs) and/or areas of operation.					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L86 / <i>LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p><i>FY 2018 Plans:</i> This will continue the work required to enhance the AN/TPQ-50's capability to address electronic protection against CEMA and other known, new emerging and evolving threats identified in the STAR. This effort will complete the development of the sensor protect effort and develop hardware modifications for technical refresh. Funding supports all associated testing costs and program support.</p> <p><i>FY 2019 Base Plans:</i> This will continue the work required to enhance the AN/TPQ-50's capability to address electronic protection against CEMA and other known, new, emerging and evolving threats identified in the STAR. In addition, it integrates developed capabilities into the baseline, develops documentation for hardware and software capability improvements, and includes operational testing for capability improvements. Funding supports all associated testing costs and program support.</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Additional funding in FY 2019 supports increased development scope.</p>					
Accomplishments/Planned Programs Subtotals	3.064	2.136	4.194	-	4.194

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• B05201: SSN: B05201 <i>Lightweight Counter Mortar Radar</i>	125.145	20.459	9.165	-	9.165	-	-	8.326	7.380	0.000	170.475

Remarks

D. Acquisition Strategy

The AN/TPQ-50 Lightweight Counter Mortar Radar was developed in 2009 to meet Training and Doctrine Command (TRADOC) Capabilities Production Document (CPD) requirements. A favorable full rate production (FRP) decision was achieved on 21 June 2013. The AN/TPQ-50 is currently in full rate production; 400 systems have been procured to complete the program's current AAO requirement.

The Fiscal Year (FY) 2019 Research, Development, Test and Evaluation (RDTE) funds of \$4.194 million will continue the work required to enhance the AN/TPQ-50's capability to address electronic protection against CEMA and other known, new, emerging and evolving threats identified in the STAR. This effort will develop and integrate sensor protect capabilities into the software baseline, develop advanced protection techniques which take advantage of hardware upgrades, and develop documentation for hardware and software capability improvements. Funding supports all associated testing costs and program support.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L86 / <i>LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)</i>

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0604823A / Firefinder				L86 / LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)								
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management (Government Support)	Various	Various : Activities	1.279	0.303	Apr 2017	0.082	May 2018	0.164	May 2019	-		0.164	Continuing	Continuing	Continuing	
Program Management (Contractor Support)	C/CPFF	Various : APG, MD	0.200	0.364	Mar 2017	0.372	Mar 2018	0.379	Mar 2019	-		0.379	Continuing	Continuing	Continuing	
Subtotal			1.479	0.667		0.454		0.543		-		0.543	Continuing	Continuing	N/A	
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Electronic Protection	SS/CPFF	Various : Various	1.870	0.460	Mar 2017	-		-		-		-	0.000	2.330	1.410	
Modernization & New and Emerging Threats	SS/CPFF	Various : Various	0.656	1.817	Mar 2017	1.382	Nov 2017	2.206	Nov 2018	-		2.206	Continuing	Continuing	Continuing	
Subtotal			2.526	2.277		1.382		2.206		-		2.206	Continuing	Continuing	N/A	
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Test Support (Government)	Various	Various : Activities	4.751	0.120	May 2017	0.300	Nov 2017	1.445	Nov 2018	-		1.445	Continuing	Continuing	Continuing	
Subtotal			4.751	0.120		0.300		1.445		-		1.445	Continuing	Continuing	N/A	
Project Cost Totals			8.756	3.064		2.136		4.194		-		4.194	Continuing	Continuing	N/A	
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L86 / <i>LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Electronic Protection	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]			
Modernization & New and Emerging Threats																												
Government Test																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L86 / <i>LIGHTWEIGHT COUNTER MORTAR RADAR (LCMR)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Electronic Protection	3	2016	4	2017
Modernization & New and Emerging Threats	3	2016	4	2023
Government Test	3	2017	4	2023

Note

RDT&E funded testing is required at the end of each development period.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604823A / Firefinder				Project (Number/Name) L87 / Hypervelocity Armament System (HAS)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
L87: Hypervelocity Armament System (HAS)	-	0.000	36.000	35.617	-	35.617	35.587	35.581	35.576	35.567	0.000	213.928
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Project L87 The Hypervelocity Armament System (HAS) and associated technologies are composed of advanced gun weapon systems, command guided maneuverable projectiles, and tactical sensors. The development of HAS would include advancing artillery powder guns firing Hypervelocity Projectiles (HVPs), resulting in a next generation, common, low drag, guided cannon artillery projectiles capable of completing multiple missions with improved cost effectiveness. Integration with a fire control radar and sensor array will allow closed-loop targeting of moving and relocatable targets beyond the range of conventional artillery. Current estimates for follow on development efforts achieve transitionable technology solutions by FY 2023.

FY 2019 Base funding in the amount of \$35.617 million supports the continued initiation of contract requirements package development, system evaluation, develop and integrate advanced gun systems, requirements/specification work, integration development, howitzer gun system integration and test plans. The Army will leverage Strategic Capabilities Office (SCO) prototypes and technologies to continue transition from the FY 2018 program into programs of record.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Hypervelocity Armament System (HAS)	-	36.000	-	-	-
Description: The Hypervelocity Armament System (HAS) will integrate advanced artillery gun systems firing HVPs with closed loop fire control sensors to engage high value moving targets beyond common artillery ranges.					
FY 2018 Plans: Supports the initiation of accelerated transition planning, contract requirements package development, system evaluation, and requirements/specification work, integration development and test plans.					
FY 2018 to FY 2019 Increase/Decrease Statement: ARDEC/SCO (Strategic Capability Office) initiated the Hypervelocity Program for FY 2018. Program was shifted in FY 2019 to Self-Propelled Howitzer Systems.					
Title: Development	-	-	30.444	-	30.444
Description: Funding is provided for all development efforts on Hypervelocity Armament System (HAS) technology transitions.					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L87 / <i>Hypervelocity Armament System (HAS)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p><i>FY 2019 Base Plans:</i> Finalize initial incremental technology transition requirements and specifications, contract requirements package development and begin execution of contracts and development. Continue support for system evaluation, requirement/specification work, integration development and test plans, prototyping, and developmental testing for the Hypervelocity Armament System to include projectile, sensor arrays and radars, launch platforms, fire control software and tracking to verify and validate performance against high value threats at greatly increased ranges.</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> ARDEC/SCO (Strategic Capability Office) operated the Hypervelocity Program in FY 2018. It was transferred to Self-Propelled Howitzer Systems in FY 2019 and funding is broken out between Development and Program Management.</p>					
<p><i>Title:</i> Program Management</p> <p><i>Description:</i> Funding is provided for all program management efforts on Hypervelocity Armament System (HAS).</p> <p><i>FY 2019 Base Plans:</i> Begin the development for all required documents, office staff and engineering Integrated Product Team (IPT) development.</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> ARDEC/SCO (Strategic Capability Office) operated the Hypervelocity Program in FY 2018. It was transferred to Self-Propelled Howitzer Systems in FY 2019 and funding is broken out between Development and Program Management.</p>	-	-	5.173	-	5.173
Accomplishments/Planned Programs Subtotals	-	36.000	35.617	-	35.617

<p>C. Other Program Funding Summary (\$ in Millions) N/A</p> <p>Remarks</p> <p>D. Acquisition Strategy The Army will leverage Strategic Capabilities Office (SCO) prototypes and technologies to continue transition from the FY 2018 program into programs of record.</p>

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L87 / <i>Hypervelocity Armament System (HAS)</i>

The Army is transitioning prototype articles from the SCO demonstration to develop advanced gun systems, command guided maneuverable projectiles, and fire control sensors capable of engaging tactical range targets. Emerging requirements include communication suite changes, munitions updates, and introduction of new munitions require software and/or hardware updates to ensure full compatibility and maintain operational viability.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / Firefinder	Project (Number/Name) L87 / Hypervelocity Armament System (HAS)
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
HAS Product Development	C/Various	TBD : TBD	-	-		36.000		30.456		-		30.456	0.000	66.456	-
Subtotal			-	-		36.000		30.456		-		30.456	0.000	66.456	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	MIPR	PM/PEO : VARIOUS	-	-		-		5.161		-		5.161	0.000	5.161	-
Subtotal			-	-		-		5.161		-		5.161	0.000	5.161	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-	36.000	35.617	-	35.617	0.000	71.617	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L87 / <i>Hypervelocity Armament System (HAS)</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Hypervelocity Armament System Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L87 / <i>Hypervelocity Armament System (HAS)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Hypervelocity Armament System Development	1	2018	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>				Project (Number/Name) L88 / <i>Enhanced AN/TPQ 36</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
L88: <i>Enhanced AN/TPQ 36</i>	-	3.113	7.469	5.662	-	5.662	8.245	8.914	9.132	9.624	0.000	52.159
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AN/TPQ-53 Counterfire Target Acquisition Radar System is a highly mobile radar set that automatically detects, classifies, tracks, and locates the point of origin of projectiles fired from mortar, artillery, and rocket systems with sufficient accuracy for first round fire for effect. It mitigates close combat radar coverage gaps by providing a 90 degree search sector (stare mode) as well as 360 degree coverage (rotating) and will replace the current AN/TPQ-36 and AN/TPQ-37 Firefinder Radars. The AN/TPQ-53 system interoperates with mission command systems (MCSs) to provide the maneuver commander increased counterfire radar flexibility. The AN/TPQ-53 is deployed as part of the Counter-Rocket, Artillery, Mortar (C-RAM) system of systems. It provides data to the Forward Area Air Defense Command and Control (FAAD C2) node for the sense and warn force protection capability. The AN/TPQ-53 is fielded to multiple Continental United States (CONUS) and Outside Continental United States (OCONUS) locations to include support to Operation Inherent Resolve (OIR).

The Fiscal Year (FY) 2019 funds of \$5.662 million will support ongoing test efforts, a tropical regions test, Army interoperability certifications (AICs), testing of modernization efforts for electronic protection and new and emerging threats as well as the performance of technical assessments, concept studies, risk reduction and required documentation.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Test support	1.742	4.325	5.662	-	5.662
Description: Funding is provided to support testing efforts.					
FY 2018 Plans:					
Test activities to include a Tropical Regions test, Army Interoperability Certification (AIC) testing, engineering and customer tests, an adversarial assessment, and associated Program Management Office (PMO) and test support costs.					
FY 2019 Base Plans:					
Test activities to include a Tropical Regions test, AIC testing, engineering and customer tests, an adversarial assessment, associated PMO and test support costs.					
FY 2018 to FY 2019 Increase/Decrease Statement:					
Increase in FY 2019 due to increased test scope to test multiple software versions.					
Title: Electronic Protection / Worldwide Interoperability for Microwave Access (WiMAX)	0.891	2.353	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L88 / <i>Enhanced AN/TPQ 36</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: This effort funds the development of radio frequency (RF) management tactical decision aids that improve operational frequency band selection, radar emplacement, and signal processor protection algorithms to defeat radar targeting armaments. The effort also improves spectrum management and mitigates electromagnetic interference (EMI) from commercial and military bands in addition to hostile EMI.</p> <p>FY 2018 Plans: Continue to mitigate EMI from military bands, hostile EMI, and the WiMAX commercial spectrum. Funding supports all associated testing costs and program support.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 development efforts will be redirected to address increased test scope. EP/WiMAX development efforts will continue in FY 2020.</p>					
<p>Title: New and Emerging Threats</p> <p>Description: This effort funds the development of capabilities not included in the current requirement resulting from the bi-annual release of the STAR and changes on the battlefield due to new TTPs and/or areas of operation.</p> <p>FY 2018 Plans: Continue developmental efforts to accurately detect, track, and locate new and emerging threats to the warfighter as a result of changes in the battlefield and areas of operation. Funding supports all associated testing costs and program support.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 development efforts will be redirected to address increased test scope. New and emerging threats development efforts will continue in FY 2020.</p>	0.480	0.791	-	-	-
Accomplishments/Planned Programs Subtotals	3.113	7.469	5.662	-	5.662

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• B05310: <i>SSN B05310 AN/TPQ-53</i>	297.509	329.057	162.121	165.200	327.321	11.120	5.972	6.279	30.244	0.000	1,007.502

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army Date: February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L88 / <i>Enhanced AN/TPQ 36</i>
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D. Acquisition Strategy

The AN/TPQ-53 leverages technology developed in the multi-mission radar advanced technology objective (ATO) program. In 2006, the Government awarded a contract following full and open competition for the design of the AN/TPQ-53 radar and the purchase of four non-recurring engineering (NRE) radars. Twelve additional quick reaction capability (QRC) radars were purchased under the same contract in response to an urgent directed procurement in July 2008. The Milestone Decision Authority (MDA) approved the acquisition of up to 20 more QRC radars. Twenty systems were procured through two separate contract actions in 2010 and 2011. A competitive production contract for Low Rate Initial Production (LRIP) systems was awarded in 2012 and options for additional systems were awarded in 2013, 2014, and 2015. Production and delivery of all QRC/Initial Production (IP) systems are complete, and production of LRIP systems is ongoing. A Full Rate Production (FRP) decision was obtained in December 2015. The FRP contract to fill the remainder of the Army Acquisition Objective (AAO) was awarded in March 2017. Additionally, all initial production systems will be retrofitted to the FRP configuration. The AAO was increased to 189 systems in May 2017; 142 systems have been procured to date. The FRP system deliveries will continue through fiscal year (FY) 2021. The system will replace all of the AN/TPQ-36 and AN/TPQ-37 systems in the fleet.

The Fiscal Year (FY) 2019 funds of \$5.662 million will support ongoing test efforts, a tropical regions test, Army interoperability certifications (AICs), testing of modernization efforts for electronic protection and new and emerging threats as well as the performance of technical assessments, concept studies, risk reduction and required documentation.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / Firefinder	Project (Number/Name) L88 / Enhanced AN/TPQ 36
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 (Government)	Various	Various : Various	1.567	0.020	Jun 2017	0.356	Nov 2017	0.276	Dec 2018	-		0.276	Continuing	Continuing	Continuing
Program Management (Contractor)	Various	Various : APG, MD	3.969	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			5.536	0.020		0.356		0.276		-		0.276	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Electronic Protection/ Worldwide Interoperability for Microwave Access (WiMAX)	SS/FPIF	Lockheed Martin : Syracuse, NY	2.155	0.891	Jan 2018	2.353	Nov 2017	-		-		-	Continuing	Continuing	Continuing
High Clutter Environment	SS/CPFF	Lockheed Martin : Syracuse, NY	10.340	-		-		-		-		-	0.000	10.340	-
Low Quadrant Elevation (QE) Shots	SS/CPFF	Lockheed Martin : Syracuse, NY	4.865	-		-		-		-		-	0.000	4.865	-
New and Emerging Threats	SS/FPIF	Lockheed Martin : Syracuse, NY	2.154	0.480	Jan 2018	0.791	Nov 2017	-		-		-	Continuing	Continuing	Continuing
Signal Data Processor (SDP)	SS/CPFF	Lockheed Martin : Syracuse, NY	1.992	-		-		-		-		-	0.000	1.992	-
Global Positioning System (GPS) Military Code (M-Code)	SS/CPFF	Lockheed Martin : Syracuse, NY	1.411	-		-		-		-		-	Continuing	Continuing	Continuing
Wireless Communication Upgrade	SS/CPFF	Lockheed Martin : Syracuse, NY	1.942	-		-		-		-		-	0.000	1.942	-
Subtotal			24.859	1.371		3.144		-		-		-	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / Firefinder	Project (Number/Name) L88 / Enhanced AN/TPQ 36
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Support	SS/CPFF	Georgia Tech Research Institute (GTRI) : Atlanta, GA	0.926	0.070	Jun 2017	-		0.300	Jan 2019	-		0.300	Continuing	Continuing	Continuing
Subtotal			0.926	0.070		-		0.300		-		0.300	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support	Various	Various : Activities	51.154	1.652	Jun 2017	3.969	Nov 2017	5.086	Dec 2018	-		5.086	Continuing	Continuing	Continuing
Subtotal			51.154	1.652		3.969		5.086		-		5.086	Continuing	Continuing	N/A

Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	82.475	3.113	7.469	5.662	-	5.662	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L88 / <i>Enhanced AN/TPQ 36</i>
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Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Full Rate Production Contract Award	1																											
Test Support																												
Electronic Protection/Worldwide Interoperability for Microwave Ac																												
EP/WIMAX																												
New and Emerging Threats																												
New & Emerging Threats																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604823A / <i>Firefinder</i>	Project (Number/Name) L88 / <i>Enhanced AN/TPQ 36</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Initial Operational Test and Evaluation (IOT&E) 2	3	2015	3	2015
Full Rate Production Contract Award	2	2017	2	2017
Test Support	1	2016	4	2023
Electronic Protection/Worldwide Interoperability for Microwave Access (EP/WiMAX)	1	2016	2	2019
EP/WiMAX	1	2020	4	2023
New and Emerging Threats	1	2016	2	2019
New & Emerging Threats	1	2020	4	2023

Note

FY 2019 development efforts will be redirected to address increased test scope. Development efforts will continue in FY 2020.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	11.929	16.127	10.395	-	10.395	6.237	3.355	1.721	1.404	Continuing	Continuing
DX7: <i>TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM</i>	-	0.728	0.879	0.325	-	0.325	0.322	0.319	0.481	0.183	Continuing	Continuing
EY2: <i>Integrated Soldier Power Data System - Core</i>	-	0.000	6.949	2.863	-	2.863	1.439	1.243	0.000	0.000	Continuing	Continuing
EY3: <i>Soldier Power Generator</i>	-	0.000	0.000	0.318	-	0.318	0.323	0.330	0.337	0.303	Continuing	Continuing
EY4: <i>Universal Battery Charger</i>	-	0.000	1.731	1.408	-	1.408	1.434	1.463	0.903	0.918	Continuing	Continuing
S65: <i>Soldier Power</i>	-	11.201	6.568	5.481	-	5.481	2.719	0.000	0.000	0.000	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element contains five projects:

Project S65 - Soldier Power: Soldier Power enables dismounted Soldiers to efficiently execute missions for longer durations by reducing the logistical burden associated with fuel and primary (disposable) batteries. Platoon Power Generation (PPG) - PM E2S2: This project supports the demonstration and development of a PPG. The Small Unit Power (SUP) PPG (1kW Generator) will provide small units with sufficient portable power to sustain Modified Table of Organizational Equipment (MTOE) unit power demand in support of 48 to 72 hour missions using a common logistical fuel (JP-8). It will be used for charging batteries and powering various types of Army communications and electronics devices.

Project EY2 - Integrated Soldier Power Data System - Core: Integrated Soldier Power and Data System-Core, Conformal Wearable Battery, Squad Power Manager (SPI) fills the power and energy gaps created by the increase in mission essential, Soldier portable power consumers, such as situational awareness displays, GPS systems, weapon sensors, radios, and other devices.

Project EY3 - Soldier Power Generator (SPG) - fills the power and energy gap created by the increase in mission essential and power consuming devices, by providing a single charging solution capable of providing power to handheld communication devices and a suite of military batteries. SPG is intended for use in the most austere operating environments providing the Soldier with energy independency for extended mission duration. The system will provide the Soldier with a lightweight, worn or carried power generation capability, integrated within the warfighters combat load.

Project EY4 - Universal Battery Charger: Universal Battery Charger (UBC) fills the power and energy gap created by the increase in mission essential, Soldier portable power consumers, by providing a sole charging solution capable of providing power to handheld communication devices and a suite of military batteries.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>
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Project DX7 - Tactical Communications and Protective System (TCAPS): TCAPS enables Soldiers to communicate over radios in combat environments while simultaneously providing hearing protection from both steady state and impulse noise.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	12.393	16.127	12.199	-	12.199
Current President's Budget	11.929	16.127	10.395	-	10.395
Total Adjustments	-0.464	0.000	-1.804	-	-1.804
• Congressional General Reductions	-0.005	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-0.459	-	-1.804	-	-1.804

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>			Project (Number/Name) DX7 / <i>TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM</i>				
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DX7: <i>TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM</i>	-	0.728	0.879	0.325	-	0.325	0.322	0.319	0.481	0.183	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Description: The Tactical Communications and Protective System (TCAPS) and TCAPS-Lite provide Soldiers with advanced, active hearing protection that simultaneously protects Soldiers' hearing while enabling situational awareness and mission command. TCAPS protects Soldiers against harmful impulse and steady state noises characteristic of combat environments while also enabling Soldiers to communicate with each other using voice communications over a tactical radio, while TCAPS-Lite provides protection for Soldiers without a radio. Both systems enhance survivability and situational awareness by allowing Soldiers to amplify faint sounds that would not be otherwise audible or intelligible. TCAPS and TCAPS-Lite reduces Soldiers noise induced hearing damage and includes integration and interface of products on Soldiers.

TCAPS and TCAPS-Lite contribute to the reduction of post-service disability compensation and limits lost in-service time related to hearing injuries. TCAPS Program of Record will continue to employ commercial-off-the-shelf (COTS) solutions that are evaluated periodically. The commercial solutions that meet the technical requirements and are rated the best by the Soldiers will transition to production and fielding.

Justification: FY19 RDTE funding supports continued testing and evaluation of enhanced protective hearing devices for soldiers in combat environments. Funding also supports annual efforts to relook technology for improved future capabilities.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: TCAPS testing and evaluation.	0.625	0.654	0.261	-	0.261
Description: Test articles procurement and testing & evaluation.					
FY 2018 Plans: Initiation of TCAPS-Lite Generation 2 test efforts. Vehicle Platform integration test and evaluation efforts for TCAPS interface with VIC-3 vehicle intercommunication systems.					
FY 2019 Base Plans: Conduct TCAPS-Lite Generation 2 developmental and operational testing.					
FY 2018 to FY 2019 Increase/Decrease Statement:					

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) DX7 / <i>TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Reduction of \$393 thousand since FY18 President's Budget submission due to reduced funding levels.					
Title: System Engineering and Program Management (SEPM)	0.103	0.225	0.064	-	0.064
Description: TCAPS system engineering and program management support.					
FY 2018 Plans: Development of test scope of work and identification of vehicle platforms to support TCAPS VIC-3 interface efforts. Develop performance parameters for construction of a TCAPS-Lite Generation 2.					
FY 2019 Base Plans: Continue development of performance parameters for TCAPS-Lite Generation 2.					
FY 2018 to FY 2019 Increase/Decrease Statement: Reduction of \$161 thousand since FY18 President's Budget submission due to reduced funding levels.					
Accomplishments/Planned Programs Subtotals	0.728	0.879	0.325	-	0.325

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• B55510: <i>Tactical Communications and Protective System</i>	3.607	4.411	0.819	9.549	10.368	0.816	0.813	0.809	0.607	Continuing	Continuing

Remarks

D. Acquisition Strategy
TCAPS is an ACAT III program that leverages commercial-off-the-shelf (COTS) technology. TCAPS conducts periodic relook of commercial technology to seek improved capabilities, reduce costs and transition to production.

E. Performance Metrics
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604827A / Soldier Systems - Warrior Dem/Val				DX7 / TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
SEPM	MIPR	PEO Soldier : Ft Belvoir, VA	0.571	0.103		0.225		0.064		-		0.064	Continuing	Continuing	Continuing
Subtotal			0.571	0.103		0.225		0.064		-		0.064	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Articles (Engineering Assessment)	MIPR	DLA DSCP : Philadelphia, PA	0.082	-		-		-		-		-	0.000	0.082	-
Test Articles (Development Test)	MIPR	DLA DSCP : Philadelphia, PA	0.058	0.092		-		-		-		-	Continuing	Continuing	Continuing
Test Articles (OT)	MIPR	DLA DSCP : Philadelphia, PA	0.405	-		-		-		-		-	0.000	0.405	-
Subtotal			0.545	0.092		-		-		-		-	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Annual Relook of Technology/Evaluation	MIPR	ATEC, AEC, OTC, ARL-SLAD : Various Locations	0.559	0.193		-		-		-		-	Continuing	Continuing	Continuing
Developmental and Operational Test	Various	ATEC, AEC, OTC, ARL-SLAD : Various Locations	0.885	0.340		0.654		0.261		-		0.261	Continuing	Continuing	Continuing
Customer Test	Various	Army Hearing Program Office : Various Locations	0.028	-		-		-		-		-	0.000	0.028	-
Subtotal			1.472	0.533		0.654		0.261		-		0.261	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 5			R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>				Project (Number/Name) DX7 / <i>TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM</i>				
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	2.588	0.728	0.879	0.325	-	0.325	Continuing	Continuing	N/A		

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) DX7 / <i>TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Annual Relook of Technology for Evaluation/Integration for FY18 Fielding	██████████																															
Developmental and Operational Assessment for FY18	██████████																															
Annual Relook of Technology for Evaluation/Integration Test for FY19 Fielding	██████████																															
Developmental and Operational Assessment for FY19 Fielding	██████████																															
Annual Relook of Technology for Evaluation/Integration Test for FY20 Fielding	██████████																															
Developmental and Operational Assessment for FY20 Fielding	██████████																															
Annual Relook of Technology for Evaluation/Integration Test for FY21	██████████																															
Developmental and Operational Assessment for FY21 Fielding	██████████																															
Annual Relook of Technology for Evaluation/Integration Test for FY22	██████████																															
Developmental and Operational Assessment for FY22 Fielding	██████████																															
Annual Relook of Technology for Evaluation/Integration Test for FY23	██████████																															
Developmental and Operational Assessment for FY23 Fielding	██████████																															
TCAPS or TCAPS-Lite Market Survey to support follow-on evaluation	██████████																															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018				
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>		Project (Number/Name) DX7 / <i>TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM</i>			

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Technical and User Evaluation in support of Current/Future FY Fielding																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) DX7 / <i>TACTICAL COMMUNICATIONS AND PROTECTIVE SYSTEM</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Annual Relook of Technology for Evaluation/Integration for FY18 Fielding	1	2017	3	2017
Developmental and Operational Assessment for FY18	2	2017	4	2017
Annual Relook of Technology for Evaluation/Integration Test for FY19 Fielding	1	2018	3	2018
Developmental and Operational Assessment for FY19 Fielding	2	2018	4	2018
Annual Relook of Technology for Evaluation/Integration Test for FY20 Fielding	1	2019	3	2019
Developmental and Operational Assessment for FY20 Fielding	2	2019	4	2019
Annual Relook of Technology for Evaluation/Integration Test for FY21	1	2020	3	2020
Developmental and Operational Assessment for FY21 Fielding	2	2020	4	2020
Annual Relook of Technology for Evaluation/Integration Test for FY22	1	2021	3	2021
Developmental and Operational Assessment for FY22 Fielding	2	2021	4	2021
Annual Relook of Technology for Evaluation/Integration Test for FY23	1	2022	3	2022
Developmental and Operational Assessment for FY23 Fielding	2	2022	4	2022
TCAPS or TCAPS-Lite Market Survey to support follow-on evaluation	1	2023	4	2023
Technical and User Evaluation in support of Current/Future FY Fielding	2	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>				Project (Number/Name) EY2 / <i>Integrated Soldier Power Data System - Core</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EY2: <i>Integrated Soldier Power Data System - Core</i>	-	0.000	6.949	2.863	-	2.863	1.439	1.243	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY18, Integrated Soldier Power Data System - Core (ISPDS-C) funding was realigned from Program Element: 0604827A (Soldier Systems Warrior Dem/Val)/Project: S65 (Soldier Power).

A. Mission Description and Budget Item Justification

Soldier Power Integrated Soldier Power and Data System-Core, Conformal Wearable Battery, Squad Power Manager (SPI) fills the power and energy gaps created by the increase in mission essential, Soldier portable power consumers, such as situational awareness displays, GPS systems, weapon sensors, radios, and other devices. Specific systems of SPI are the Integrated Soldier Power and Data System-Core (ISPDS-C), the Conformal Wearable Battery (CWB) and the Squad Power Manager (SPM). This RDT&E line develops power sources and solutions suited for not only the individual Soldier, but for the team and squad. These power solutions are intended for use in the most austere operating environments and include, but are not limited to, individual Soldier worn systems, integrated power management, and renewable energy. SPI systems will enable dismounted Soldiers to execute their missions more efficiently, for longer durations and with fewer battery resupplies. SPI systems will also reduce the logistical burden associated with moving fuel and primary (disposable) batteries, and allow dismounted Soldiers to operate independently for longer missions without being tethered to a large generator, vehicle, or supply train. This effort is consistent with the Soldier Protection Capability Development Document (CDD) (March 2011), Operational Energy Initial Capabilities Document (26 April 2012), the Small Unit Power CDD (26 September 2013), and the SPM, ISPDS-C with Conformal Central Power Source Capability Production Document (May 2017).

Justification: FY19 RDT&E continues to develop power sources and solutions suited for not only the individual Soldier, but for the team and squad. These power solutions are intended for use in the most austere operating environments and include, but are not limited to, individual Soldier worn systems, integrated power management, and renewable energy.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Test and Evaluation	-	1.210	0.504	-	0.504
Description: Will continue to test and validate new battery chemistries and interfaces with the IPSPDS-C and SPM.					
FY 2018 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY2 / <i>Integrated Soldier Power Data System - Core</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Will conduct required testing to support a new contract award for the ISPDS-C. Will conduct required testing to support a new contract award for the CWB. Will test and validate new battery chemistries and interfaces with the IPSPDS-C and SPM.</p> <p>FY 2019 Base Plans: Will continue to evaluate intra-Soldier wireless technologies.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY18 to FY19 funding decrease due to downward funding adjustments.</p>					
<p>Title: System Engineering & Program Management</p> <p>FY 2018 Plans: Will develop and evaluate a power and data management hub that contains host control capability. Will continue to evaluate intra-Soldier wireless technologies.</p> <p>FY 2019 Base Plans: Will continue to evaluate intra-Soldier wireless technologies.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY18 to FY19 funding decrease due to downward funding adjustments.</p>	-	1.889	0.787	-	0.787
<p>Title: ISPDS-C/CWB Capability Improvements Integration</p> <p>FY 2018 Plans: Conduct evaluation of new equipment for suitability and the ability to interface within the Soldier Power and Data Architecture. Will conduct integration of new lightweight, Soldier Power Generation, chargers / harvesters, and generators capable of supporting the variety of power devices used in tactical formations.</p> <p>FY 2019 Base Plans: Continue to conduct integration of new lightweight, Soldier Power Generation, chargers / harvesters, and generators capable of supporting the variety of power devices used in tactical formations.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY18 to FY19 funding decrease due to downward funding adjustments.</p>	-	3.850	1.572	-	1.572
Accomplishments/Planned Programs Subtotals	-	6.949	2.863	-	2.863

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY2 / <i>Integrated Soldier Power Data System - Core</i>

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

Line Item	FY 2017	FY 2018	FY 2019	FY 2019	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Cost To	
			Base	OCO	Total					Complete	Total Cost
• S65: <i>Soldier Systems - Warrior Dem/Val (Soldier Power)</i>	11.201	6.568	5.481	-	5.481	2.719	-	-	-	0.000	25.969
• EY4: <i>Universal Battery Charger</i>	-	1.731	1.408	-	1.408	1.434	1.463	0.903	0.918	0.000	7.857
• R80010: <i>Small Unit Power Increment 1</i>	22.014	-	0.000	-	0.000	-	-	-	-	0.000	22.014
• R09103: <i>Universal Battery Charger</i>	-	3.086	8.456	-	8.456	9.865	10.076	10.119	10.131	Continuing	Continuing
• EY3: <i>Soldier Power Generator</i>	-	-	0.318	-	0.318	0.323	0.330	0.337	0.303	Continuing	Continuing
• R08090: <i>Integrated Soldier Power Data System - Core</i>	-	7.370	22.318	-	22.318	17.800	20.778	22.269	18.446	Continuing	Continuing

Remarks

D. Acquisition Strategy

Pursue a variety of Soldier power initiatives under full and open competition. These initiatives range from Commercial-Off-The-Shelf (COTS) solutions to developmental efforts. The type of solicitation depends on the maturity of the technology. The power initiatives will be evaluated through scheduled test and evaluation events, and if successful, selected for procurement and subsequent fielding and sustainment. The acquisition strategy varies by product. For example, the SPM acquisition strategy will consist of two phases: Phase one includes the purchase of test articles using the Defense Logistics Agency (DLA) Special Operational (Spec Ops) Equipment Tailored Logistic Support Program (TLSP). Phase two includes the procurement of additional test articles through Indefinite Delivery Indefinite Quantity (IDIQ) contracts established through the Army Contracting Command (ACC). The Project Manager office will establish IDIQ contracts to support the SPI requirements over time. Each SPI system will be procured under purchase orders for production quantities that will be awarded on a Firm Fixed Price (FFP) contract. Award developmental contracts for intra-soldier wireless technology through the Army Research, Development and Engineering Command.

E. Performance Metrics

NA

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY2 / <i>Integrated Soldier Power Data System - Core</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support	MIPR	Various : Various	-	-		1.889		0.756		-		0.756	Continuing	Continuing	-
Subtotal			-	-		1.889		0.756		-		0.756	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
ISPDS-C, CWB Capability Improvements Integration	MIPR	Various : Various	-	-		3.850		1.603		-		1.603	0.000	5.453	-
Subtotal			-	-		3.850		1.603		-		1.603	0.000	5.453	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 & Evaluation	MIPR	Various : Various	-	-		1.210		0.504		-		0.504	0.000	1.714	-
Subtotal			-	-		1.210		0.504		-		0.504	0.000	1.714	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
	Project Cost Totals		-	-	6.949	2.863	-	2.863	Continuing	Continuing

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY2 / <i>Integrated Soldier Power Data System - Core</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Annual Relook of Technology					■ Evaluation/Integration																							
Testing of Product Improvements					■ Evaluation																							
Annual Relook of Technology 2					■ Evaluation/Integration																							
Testing of Product Improvements 2					■ Evaluation																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY2 / <i>Integrated Soldier Power Data System - Core</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Annual Relook of Technology	3	2018	4	2018
Testing of Product Improvements	3	2019	4	2019
Annual Relook of Technology 2	3	2020	4	2020
Testing of Product Improvements 2	3	2021	4	2021

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY3 / <i>Soldier Power Generator</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EY3: <i>Soldier Power Generator</i>	-	0.000	0.000	0.318	-	0.318	0.323	0.330	0.337	0.303	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note
Beginning in FY19, funding for Soldier Power Generator was realigned from Program Element: 0604827A (Soldier Systems - Warrior Dem/Val)/Project: S65 (Soldier Power).

A. Mission Description and Budget Item Justification

Soldier Power Generation (SPG) fills the power and energy gap created by the increase in mission essential and power consuming devices, by providing a single charging solution capable of providing power to handheld communication devices and a suite of military batteries. SPG is intended for use in the most austere operating environments providing the Soldier with energy independency for extended mission duration. The system will provide the Soldier with a lightweight, worn or carried power generation capability, integrated within the warfighters combat load.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Test and Evaluation	-	-	0.318	-	0.318
Description: Test emerging technologies.					
FY 2019 Base Plans: Evaluate emerging power generation technologies.					
FY 2018 to FY 2019 Increase/Decrease Statement: Not applicable. Program funding stream starts in FY19.					
Accomplishments/Planned Programs Subtotals	-	-	0.318	-	0.318

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• S65: <i>Soldier Systems - Warrior Dem/Val (Soldier Power)</i>	11.201	6.568	5.481	-	5.481	2.719	-	-	-	0.000	25.969
• EY2: <i>Integrated Soldier Power</i>	-	6.949	2.863	-	2.863	1.439	1.243	-	-	0.000	12.494
• EY4: <i>Universal Battery Charger</i>	-	1.731	1.408	-	1.408	1.434	1.463	0.903	0.918	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY3 / <i>Soldier Power Generator</i>

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

Line Item	FY 2017	FY 2018	FY 2019	FY 2019	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Cost To	Total Cost
			Base	OCO	Total					Complete	
• R80010: <i>Small Unit Power Increment 1</i>	22.014	-	0.000	-	0.000	-	-	-	-	0.000	22.014
• R08090: <i>Integrated Soldier Power Data System - Core</i>	-	7.370	22.318	-	22.318	17.800	20.778	22.269	18.446	Continuing	Continuing
• R09103: <i>Universal Battery Charger</i>	-	3.086	8.456	-	8.456	9.865	10.076	10.119	10.131	Continuing	Continuing

Remarks

D. Acquisition Strategy

Develop and mature a range of Soldier Power Generation technologies, based on technical tests and Soldier feedback, to determine the best material solution and award a full and open competition utilizing an Indefinite Delivery Indefinite Quantity (IDIQ) production contract scheduled for award in Fiscal Year 2020.

E. Performance Metrics

NA

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army											Date: February 2018				
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0604827A / Soldier Systems - Warrior <i>Dem/Val</i>				Project (Number/Name) EY3 / Soldier Power Generator							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering and Prgram Management (SEPM)	MIPR	PEO Soldier, Ft. Belvoir, VA : TBD	-	-		-		0.045		-		0.045	0.000	0.045	-
Subtotal			-	-		-		0.045		-		0.045	0.000	0.045	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Test	TBD	Various : TBD	-	-		-		0.273		-		0.273	0.000	0.273	-
Subtotal			-	-		-		0.273		-		0.273	0.000	0.273	N/A
Project Cost Totals			-	-		0.000		0.318		-		0.318	0.000	0.318	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY3 / <i>Soldier Power Generator</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Test and Evaluation									[Redacted] Emerging Technologies																			
Test and Eval													[Redacted] Power Generation Integration															
Test and Evaluation Continued													[Redacted] Developmental Test of Charging Solutions															

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY3 / <i>Soldier Power Generator</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Test and Evaluation	1	2019	2	2019
Test and Eval	1	2020	2	2020
Test and Evaluation Continued	2	2021	2	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>			Project (Number/Name) EY4 / <i>Universal Battery Charger</i>				
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EY4: <i>Universal Battery Charger</i>	-	0.000	1.731	1.408	-	1.408	1.434	1.463	0.903	0.918	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY18, funding for Universal Battery Charger realigned from Program Element: 0604827A (Soldier Systems - Warrior Dem/Val)/Project S65 (Soldier Power).

A. Mission Description and Budget Item Justification

The Universal Battery Charger (UBC) fills the power and energy gap created by the increase in mission essential and power consuming devices, by providing a single charging solution capable of providing power to handheld communication devices and a suite of military batteries. The UBC charging solution is suited for the squad and platoon and intended for use in the most austere operating environments. The system can draw power from wall outlets, vehicle power, and solar power sources. The UBC enables dismounted Soldiers to execute their missions with fewer battery resupplies, thus reducing the logistical burden associated with moving fuel and primary (disposable) batteries. The UBC capability also allows dismounted Soldiers to operate independently for longer missions without being tethered to a large generator, vehicle, or supply train. Funding will develop vehicle integration kits that allow the UBC to be mounted on Light Tactical Vehicle (LTV), Family of Military Tactical Vehicles (FMTV), Light Medium Tactical Vehicle (LMTV), Mine-Resistant Ambush Protected (MRAP) and the High Mobility Multipurpose Wheeled Vehicle (HMMWV) platforms. This effort is consistent with the Operational Energy ICD (26 April 2012) and the Universal Battery Charger CPD (27 May 2015). Milestone C Full Rate Production decision occurred 17 July 2017.

Justification: FY19 RDTE funding develops the Transit Case Adapter and tests UBC Lite.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Test & Evaluation	-	1.413	1.162	-	1.162
FY 2018 Plans: Conduct vehicle integration testing of the UBC Vehicle Integration Kit (VIK) on vehicle platforms. Test and evaluate new battery chemistries and interfaces with the UBC.					
FY 2019 Base Plans: Reduction of Universal Battery Charger size and weight as well as increase the battery recharging performance.					
FY 2018 to FY 2019 Increase/Decrease Statement: FY18 to FY19 funding decrease due to downward funding adjustments.					
Title: System Engineering & Program Management	-	0.318	0.246	-	0.246
FY 2018 Plans:					

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY4 / <i>Universal Battery Charger</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Design and develop the UBC Vehicle Integration Kit (VIK) for vehicle platforms. Develop alternate dismounted charging solutions to reduce Soldier bulk and load.					
<i>FY 2019 Base Plans:</i> Continue to develop the UBC Vehicle Integration Kit (VIK) and alternate dismounted charging solutions to reduce Soldier bulk and load.					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> FY18 to FY19 funding decrease due to downward funding adjustments.					
Accomplishments/Planned Programs Subtotals	-	1.731	1.408	-	1.408

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• R80010: <i>Small Unit Power Increment 1</i>	22.014	-	0.000	-	0.000	-	-	-	-	0.000	22.014
• R09103: <i>Universal Battery Charger</i>	-	3.086	8.456	-	8.456	9.865	10.076	10.119	10.131	0.000	51.733
• S65: <i>Soldier Power</i>	11.201	6.568	5.481	-	5.481	2.719	-	-	-	0.000	25.969
• EY2: <i>Integrated Soldier Power Data System - Core</i>	-	6.949	2.863	-	2.863	1.439	1.243	-	-	0.000	12.494
• EY3: <i>Soldier Power Generator</i>	-	-	0.318	-	0.318	0.323	0.330	0.337	0.303	0.000	1.611
• R08090: <i>Integrated Soldier Power Data System - Core</i>	-	7.370	22.318	-	22.318	17.800	20.778	22.269	18.446	0.000	108.981

Remarks

D. Acquisition Strategy
Using full and open competition, an Indefinite Delivery Indefinite Quantity (IDIQ) production contract was awarded 27 January 2016, in order to procure the UBC. The IDIQ contract contains First Article Testing (FAT) Contract Line Item Numbers (CLINs) to support initial testing activities. Additionally, the contracts will contain production CLINs to ensure the Project Management office can carry out production buys. The system will be procured under purchase orders for production quantities that will be awarded on a Firm Fixed Price (FFP) contract. Primary development activities for Fiscal Year 2018 (FY18) are the development of the UBC Vehicle Integration Kit (VIK). The UBC VIKs will be designed, developed, and tested in partnership with the Product Manager for AMPV (PM AMPV).

E. Performance Metrics
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY4 / <i>Universal Battery Charger</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support	MIPR	Various : Various	-	-		0.318		0.246		-		0.246	0.318	0.882	-
Subtotal			-	-		0.318		0.246		-		0.246	0.318	0.882	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 & Evaluation	MIPR	Various : Various	-	-		1.413		1.162		-		1.162	1.139	3.714	-
Subtotal			-	-		1.413		1.162		-		1.162	1.139	3.714	N/A

Project Cost Totals	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	1.731	1.408	-	1.408	1.457	4.596	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY4 / <i>Universal Battery Charger</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Alternative Dismounted Charging Solutions Development																												
Universal Battery Charger (UBC) Test Report Complete					▲ 1																							
Vehicle Integration LTV/HMMWV									■ LTV/HMMWV																			
Vehicle Integration FMTV/HMMWV													■ FMTV/HMMWV															
Vehicle Integration FMTV/LTV																	■ FMTV/LTV											
Vehicle Integration MRAP/LMTV																					■ MRAP/LMTV							
Evaluation of modernized battery chargers																												
Continued evaluation of modernized battery chargers																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) EY4 / <i>Universal Battery Charger</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Alternative Dismounted Charging Solutions Development	1	2018	1	2018
Universal Battery Charger (UBC) Test Report Complete	3	2017	3	2017
Vehicle Integration LTV/HMMWV	4	2018	4	2018
Vehicle Integration FMTV/HMMWV	4	2019	4	2019
Vehicle Integration FMTV/LTV	4	2020	4	2020
Vehicle Integration MRAP/LMTV	4	2021	4	2021
Evaluation of modernized battery chargers	4	2022	4	2022
Continued evaluation of modernized battery chargers	4	2023	4	2023

Note

Beginning in FY18, funding for Universal Battery Charger was realigned from Program Element: 0604827A (Soldier Systems - Warrior Dem/Val)/Project S65/Soldier Power. Prior to this realignment Soldier and Small Unit Power initiated developmental and test power solutions for the UBC technologies.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior</i> <i>Dem/Val</i>	Project (Number/Name) S65 / <i>Soldier Power</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
S65: <i>Soldier Power</i>	-	11.201	6.568	5.481	-	5.481	2.719	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Soldier and Small Unit Power (SUP) enables dismounted Soldiers to efficiently execute missions for longer durations by reducing the logistical burden associated with fuel and primary (disposable) batteries. Power solutions address energy deficits resulting from increased power demands associated with providing the Soldier with increased situational awareness displays, Global Positioning System (GPS) systems, weapon sensors, radios, and other devices. The Soldier and Small Unit Power system develops and tests power sources and solutions suited for the individual Soldier, team, squad, and platoon in the most austere operating environments, while also providing dismounted Soldiers the ability to execute their missions more efficiently, for longer durations and with fewer battery resupplies. An integrated Soldier power system will provide the Soldier with a wearable power supply that will be significantly more efficient than carrying separate batteries for each device. Soldier power systems will also reduce the logistical burden associated with moving fuel and primary (disposable) batteries, and allow dismounted Soldiers to operate independently for longer missions without being tethered to a large generator, vehicle, or supply train. SUP develops systems that consist of the Integrated Soldier Power and Data System-Core (ISPDS-C), Conformal Wearable Battery (CWB), Squad Power Manager (SPM), Universal Battery Charger (UBC), and Soldier Power Generation (SPG) Technologies. Develops and evaluates additional sources of power such as individual Soldier worn systems, renewable energy, and kinetic energy harvesting technologies. This effort is consistent with the Sep 2013 Small Unit Power CDD, the Dec 2011 Operational Energy ICD, and the Mar 2011 Soldier Protection CDD, and the Universal Battery Charger CPD (May 2015).

Justification: Soldier and Small Unit Power will continue to develop and test power solutions for the ISPDS, UBC, CWB, SPM and SPG technologies for fielding to Army Brigade Combat Teams.

Platoon Power Generator - PM E2S2: This project supports the demonstration and development of a Platoon Power Generation (PPG). The Small Unit Power PPG (1kW Generator) will provide small units with sufficient portable power to sustain Modified Table of Organizational Equipment (MTOE) unit power demand in support of 48 to 72 hour missions using a common logistical fuel (JP-8). It will be used for charging batteries and powering various types of Army communications and electronics devices. It will provide sufficient power to recharge and power all Platoon equipment and fulfill residual power gaps at the Squad and Soldier level. The generator will provide Platoon power for charging batteries when away from vehicles in all Brigade Combat Teams (Stryker, Armor and Infantry), Rangers and Special Forces in austere environments. FY 2019 funds will be used to continue the EMD Phase.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Soldier Power Generation (SPG)	7.508	-	-	-	-
Description: Soldier portable, renewable energy solutions for Soldier Power Generation.					
Title: Soldier Power Test and Evaluation	1.404	-	-	-	-

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) S65 / <i>Soldier Power</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: Integration testing and annual testing and evaluation events					
Title: Platoon Power Generation (PPG) - PM E2S2	2.289	6.568	5.481	-	5.481
Description: Prepare for award and manage an EMD phase R&D contract for the PPG.					
FY 2018 Plans: Award EMD contract and fund applicable functional agreements					
FY 2019 Base Plans: Continue with EMD Phase. Support Critical Design Review (CDR) and Developmental Testing.					
FY 2018 to FY 2019 Increase/Decrease Statement: FY19 funding for preparation for award for EMD phase decreased very slightly (2 percent) from FY18.					
Accomplishments/Planned Programs Subtotals	11.201	6.568	5.481	-	5.481

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• R80010: <i>Small Unit Power Increment 1</i>	22.014	-	0.000	-	0.000	-	-	-	-	0.000	22.014
• R08090: <i>Integrated Soldier Power Data System - Core</i>	-	7.370	22.318	-	22.318	17.800	20.778	22.269	18.446	0.000	108.981
• R09103: <i>Universal Battery Charger</i>	-	3.086	8.456	-	8.456	9.865	10.076	10.119	10.131	0.000	51.733
• EY2: <i>Integrated Soldier Power Data System - Core</i>	-	6.949	2.863	-	2.863	1.439	1.243	-	-	0.000	12.494
• EY4: <i>Universal Battery Charger</i>	-	1.731	1.408	-	1.408	1.434	1.463	0.903	0.918	0.000	7.857
• EY3: <i>Soldier Power Generator</i>	-	-	0.318	-	0.318	0.323	0.330	0.337	0.303	0.000	1.611

Remarks

D. Acquisition Strategy
Soldier and Small Unit Power

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) S65 / <i>Soldier Power</i>
<p>In FY17 Pursued a variety of Soldier power initiatives under full and open competition. These initiatives range from Commercial-Off-The-Shelf (COTS) solutions to developmental efforts. The type of solicitation depends on the maturity of the technology. The power initiatives will be evaluated through scheduled test and evaluation events, and if successful, selected for procurement and subsequent fielding and sustainment. The acquisition strategy varies by product. For example, the SPM acquisition strategy will consist of two phases: Phase one includes the purchase of test articles using the Defense Logistics Agency (DLA) Special Operational (Spec Ops) Equipment Tailored Logistic Support Program (TLSP). Phase two includes the procurement of additional test articles through Indefinite Delivery Indefinite Quantity (IDIQ) contracts established through the Army Contracting Command (ACC). The Project Manager office will establish IDIQ contracts to support the SUP requirements over time. Each SUP system will be procured under purchase orders for production quantities that will be awarded on a Firm Fixed Price (FFP) contract. Funding realigned to Projects EY2 and EY4 starting in FY18.</p> <p>PEO CS/CSS Effort on the Platoon Power Generation - PM E2S2:</p> <p>Will use Other Transactional Agreement (OTA) contract vehicle culminating in an EMD award of up to two (2) Firm Fixed Price (FFP) contracts supporting an 18-24 month Engineering and Manufacturing Development (EMD) phase. Two selected contractors will be awarded EMD contracts and will separately fabricate and produce the minimum order of 10 Small Unit Power Platoon Power Generation (1kW Generator) systems (5 per vendor). The selected vendors will produce 5 additional systems to undergo developmental test (DT), a logistics demonstration (LD), pre-production qualification test, and limited user / operational test (LUT/OT). Upon successful completion of these tests and completion of logistics supportability, the performance data and Soldier's feedback will be utilized in preparation for Milestone C (MS C) 4th Qtr FY20</p> <p><u>E. Performance Metrics</u> NA</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) S65 / <i>Soldier Power</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 integration and oversight	MIPR	Various : Various	3.342	1.936		-		-		-		-	0.000	5.278	-
Platoon Power Generation	Various	PM E2S2 : Fort Belvoir, VA	-	-		0.225		0.230		-		0.230	0.000	0.455	-
Subtotal			3.342	1.936		0.225		0.230		-		0.230	0.000	5.733	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Soldier Power Development and Integration	TBD	TBD : TBD	12.797	5.111		-		-		-		-	0.000	17.908	-
Platoon Power Generation	C/FFP	TBD : TBD	-	1.500		2.813		4.471		-		4.471	1.500	10.284	-
Subtotal			12.797	6.611		2.813		4.471		-		4.471	1.500	28.192	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	ARL, CERDEC, Various : Various	2.583	0.496		-		-		-		-	0.294	3.373	-
Platoon Power Generation	IA	TBD : TBD	0.822	0.534		1.463		0.230		-		0.230	0.600	3.649	-
Subtotal			3.405	1.030		1.463		0.230		-		0.230	0.894	7.022	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Various Testing Organizations	MIPR	Various : Various	1.329	1.404		-		-		-		-	0.000	2.733	-

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) S65 / <i>Soldier Power</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Prototype Testing (Soldier Power Generation)	██████████																											
Developmental Testing (Soldier Power Generation)					██████████																							
Renewable Power Sources Technology Improvement	██████████																											
Wireless Charging					██████																							
Milestone B (PPG)					▲ 1 Milestone B Platoon Power Generation (PPG)																							
EMD Contract Award (PPG)					▲ 2 Contract Award (PPG)																							
Critical Design Review (CDR) (PPG)									▲ 3 CDR (PPG)																			
Developmental Testing (PPG)									████████████████████																			
Limited User Test (LUT) (PPG)													▲ 4 LUT (PPG)															
Milestone C (PPG)																	▲ 5 Milestone C (PPG)											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604827A / <i>Soldier Systems - Warrior Dem/Val</i>	Project (Number/Name) S65 / <i>Soldier Power</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Prototype Testing (Soldier Power Generation)	1	2016	3	2017
Developmental Testing (Soldier Power Generation)	4	2017	1	2018
Renewable Power Sources Technology Improvement	1	2017	4	2017
Wireless Charging	4	2017	4	2017
Milestone B (PPG)	3	2018	3	2018
EMD Contract Award (PPG)	4	2018	4	2018
Critical Design Review (CDR) (PPG)	4	2019	4	2019
Developmental Testing (PPG)	3	2019	1	2021
Limited User Test (LUT) (PPG)	2	2020	2	2020
Milestone C (PPG)	4	2020	4	2020

UNCLASSIFIED

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604852A / <i>Suite of Vehicle Protection Systems - EMD</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	98.600	69.204	-	69.204	47.706	93.852	97.634	120.682	0.000	527.678
FE8: <i>Vehicle Protection Suite</i>	-	0.000	14.800	26.904	-	26.904	47.706	93.852	97.634	120.682	0.000	401.578
XU9: <i>Active Protection System</i>	-	0.000	83.800	42.300	-	42.300	0.000	0.000	0.000	0.000	0.000	126.100

Note

Project XU9 (Active Protection System) is a continuation of efforts previously executed under PE 0203735A - Combat Vehicle Improvement Programs.

A. Mission Description and Budget Item Justification

Current ground combat vehicle platforms and tactical wheeled vehicles within Army Brigade Combat Teams (BCTs) lack the ability to effectively detect, track, divert, disrupt, neutralize, or destroy incoming direct or indirect fired threat munitions. Current solutions to defeat these threats, Explosive Reactive Armor (ERA) and Slat armor, do not provide preemptive or active protection and impose secondary blast hazards to crew, dismounted soldiers, and adjacent vehicles and equipment. The Suite of Vehicle Protection Systems - EMD Program Element (0604852A) will develop and mature solutions to increase the protection of the Army's ground systems from both current and next generation direct or indirect fired threat munitions.

The Active Protection System Project (XU9) will install and characterize Non-Developmental Item (NDI) Active Protection Systems on Abrams, Bradley, and Stryker demonstrator vehicles. The Active Protection System effort will assess the maturity, performance, and integration risk of NDI Active Protection Systems, develop and refine Abrams, Bradley, and Stryker Active Protection System installation kit designs, and build prototypes necessary to conduct performance and safety testing to obtain an Active Protection System Urgent Materiel Release (UMR). The Active Protection System NDI effort will also serve to inform the Vehicle Protection Suite Analysis of Alternatives (AoA).

The Vehicle Protection Suite (VPS) Project (FE8) will design, mature, and evaluate combinations of active, reactive, and passive solutions and leverage both Horizontal Technology Integration (HTI) principles and the Army's Modular Active Protection System (MAPS) to develop tailored vehicle Survivability Sets that will mitigate existing protection gaps, allow for future technology insertion to meet evolving threats, and minimize the impact to the current capabilities hosted on Army ground system platforms.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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 0604852A / <i>Suite of Vehicle Protection Systems - EMD</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	98.600	28.900	-	28.900
Current President's Budget	0.000	98.600	69.204	-	69.204
Total Adjustments	0.000	0.000	40.304	-	40.304
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Reimbursable to Direct funded Salaries	-	-	-1.996	-	-1.996
• Bradley and Stryker Continued Characterization Effort	-	-	42.300	-	42.300

Change Summary Explanation

- Reduction of funding to move salaries from program line (reimbursable) to be funded direct in OMA 43510700.
- Increase of \$42.300 million for continuation of Bradley and Stryker Non-Developmental Item Active Protection System.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD				Project (Number/Name) FE8 / Vehicle Protection Suite			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FE8: <i>Vehicle Protection Suite</i>	-	0.000	14.800	26.904	-	26.904	47.706	93.852	97.634	120.682	0.000	401.578
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Current ground combat vehicle platforms and tactical wheeled vehicles within Army Brigade Combat Teams (BCTs) lack the ability to effectively detect, track, divert, disrupt, neutralize, or destroy incoming direct or indirect fired threat munitions. Current solutions to defeat these threats, Explosive Reactive Armor (ERA) and Slat armor, do not provide preemptive or active protection and impose secondary blast hazards to crew, dismounted soldiers, and adjacent vehicles and equipment.

Vehicle Protection Suite (VPS) will design, mature, and evaluate combinations of active, reactive, and passive solutions and leverage both Horizontal Technology Integration (HTI) principles and the Army's Modular Active Protection System (MAPS) to develop tailored vehicle Survivability Sets that will mitigate existing protection gaps, allow for future technology insertion to meet evolving threats, and minimize the impact to the current capabilities hosted on Army ground system platforms.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Maturation and Characterization of MAPS Compliant/Non-developmental Item (NDI) Capabilities Description: Funding provided supports MAPS maturation efforts. FY 2018 Plans: Maturation and characterization of MAPS compliant/NDI capabilities (Hardware, Software, Interfaces, etc.). Results will inform VPS Analysis of Alternatives (AoA). FY 2019 Base Plans: Continues maturation and characterization of MAPS compliant/NDI capabilities (Hardware, Software, Interfaces, etc.). Results will inform VPS Analysis of Alternatives (AoA). FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 supports an increased level of safety and survivability characterization testing.	-	8.200	11.257	-	11.257
Title: VPS - Analysis of Alternatives (AoA) Description: Funding provided support VPS Analysis of Alternatives (AoA) . FY 2018 Plans: Perform Analysis of Alternatives (AoA) of both existing and developmental active, reactive, and passive protection solutions. The VPS AoA will assess the cost, maturity, complexity, performance, and physical	-	3.050	2.860	-	2.860

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD	Project (Number/Name) FE8 / Vehicle Protection Suite

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>properties of alternative survivability sets to determine the optimal application of VPS into to the Army's ground platforms.</p> <p>FY 2019 Base Plans: Continuing Analysis of Alternatives (AoA) of both existing and developmental active, reactive, and passive protection solutions. The VPS AoA will assess the cost, maturity, complexity, performance, and physical properties of alternative survivability sets to determine the optimal application of VPS into to the Army's ground platforms.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY 2018 plan supports the initial 9 months of effort required to execute the VPS AoA. FY 2019 plan supports the final 8 months of effort required to complete the VPS AoA.</p>					
<p>Title: Source Selection Evaluation Board</p> <p>Description: Funding provided support VPS Source Selection Board (SSEB) efforts</p> <p>FY 2019 Base Plans: The VPS SSEB will evaluate vendor(s) to develop MAPS-compliant VPS survivability sets for integration or installation on selected platforms across the vehicle fleet.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 plan includes initiation of the VPS Source Selection Evaluation Boards (SSEB).</p>	-	-	6.080	-	6.080
<p>Title: Vehicle Protection Suite Government Engineering and Program Management</p> <p>Description: Funding provided support government management support for VPS, MAPS oversight, and SSEB preparation</p> <p>FY 2018 Plans: Government program management support (labor, travel, training, supplies, and equipment) to support VPS program planning, to include the oversight of MAPS characterization, the VPS AoA, and preparation for source selection of vendor(s) to develop MAPS-compliant VPS survivability sets.</p> <p>FY 2019 Base Plans:</p>	-	2.350	6.707	-	6.707

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD	Project (Number/Name) FE8 / Vehicle Protection Suite

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continuing government program management support (labor, travel, training, supplies, and equipment) to support VPS program planning, to include the oversight of MAPS characterization. FY 2018 to FY 2019 Increase/Decrease Statement: VPS program initiation in FY 2018 reflects partial year of program oversight. FY2019 reflective of a full year of program oversight.					
Title: MAPS Controller Characterization - Test Support Description: Funding provided support MAPS test support FY 2018 Plans: Test planning support in preparation for FY19 characterization of the MAPS controller FY 2018 to FY 2019 Increase/Decrease Statement: Decrease is due to completion of the characterization test planning effort.	-	1.200	-	-	-
Accomplishments/Planned Programs Subtotals	-	14.800	26.904	-	26.904

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

N/A

Remarks

D. Acquisition Strategy

In FY 2018, the VPS program will initiate characterization of the MAPS compliant/NDI capabilities (Hardware, Software, Interfaces, etc.) to inform the VPS Analysis of Alternatives (AoA). The VPS AoA will assess the cost, maturity, complexity, performance and physical properties of alternative survivability sets to determine the optimal application of VPS into the Army's ground platforms. A. Source Selection Evaluation Boards (SSEB) will be initiated in FY19 to select vendor(s) to develop MAPS-compliant VPS survivability sets for integration or installation on selected platforms across the vehicle fleet. The VPS platform integration contracts are planned for award in the first quarter of FY 2020.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD	Project (Number/Name) FE8 / Vehicle Protection Suite
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Vehicle Protection Suite Program Management	MIPR	TACOM Warren, Michigan : Various	-	-		2.350	Oct 2017	6.707	Oct 2018	-		6.707	28.196	37.253	-
Subtotal			-	-		2.350		6.707		-		6.707	28.196	37.253	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Maturation and Characterization of MAPS Compliant/Non-developmental Item (NDI) Capabilities	MIPR	Various TACOM Warren : Warren, MI	-	-		8.200	Nov 2017	11.257	Dec 2018	-		11.257	0.000	19.457	-
Subtotal			-	-		8.200		11.257		-		11.257	0.000	19.457	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Vehicle Protection Suite Analysis of Alternatives (AoA)	MIPR	Various : TACOM Warren Michigan	-	-		3.050	Jan 2018	2.860	Jan 2019	-		2.860	0.000	5.910	-
VPS Source Selection Evaluation Board	MIPR	Various : TACOM Warren Michigan	-	-		-		6.080	Dec 2018	-		6.080	0.000	6.080	-
Subtotal			-	-		3.050		8.940		-		8.940	0.000	11.990	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD	Project (Number/Name) FE8 / Vehicle Protection Suite
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
MAPS enabled softkill/hardkill characterization planning	MIPR	TACOM : Warren, MI	-	-		1.200	Aug 2018	-		-		-	Continuing	Continuing	Continuing
Subtotal			-	-		1.200		-		-		-	Continuing	Continuing	N/A

Remarks
N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	14.800	26.904	-	26.904	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD	Project (Number/Name) FE8 / Vehicle Protection Suite

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Characterization of MAPS with Softkill/Hardkill Solutions					MAPS characterization																							
VPS NDI Capability Install/Characterization					VPS NDI Capability Install/Characterization																							
Vehicle Protection Suite (VPS) Analysis of Alternatives (AoA)					VPS Analysis of Alternatives																							
Vehicle Protection Suite (VPS) Source Selection Evaluation Boards (SSEB)					VPS SSEBs																							
Vehicle Protection Suite (VPS) Milestone B													▲ 1 VPS MSB															
Vehicle Protection Suite (VPS) Development Contract Awards													▲ 2 VPS Development Contract Awards															
Vehicle Protection Suite (VPS) MAPS Development/Maturation													VPS MAPS Development/Maturation															
Vehicle Protection Suite (VPS) Platform Integration													VPS Platform Integration															

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD	Project (Number/Name) FE8 / Vehicle Protection Suite

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Characterization of MAPS with Softkill/Hardkill Solutions	2	2018	4	2019
VPS NDI Capability Install/Characterization	2	2018	4	2019
Vehicle Protection Suite (VPS) Analysis of Alternatives (AoA)	2	2018	3	2019
Vehicle Protection Suite (VPS) Source Selection Evaluation Boards (SSEB)	1	2019	4	2019
Vehicle Protection Suite (VPS) Milestone B	4	2019	4	2019
Vehicle Protection Suite (VPS) Development Contract Awards	1	2020	1	2020
Vehicle Protection Suite (VPS) MAPS Development/Maturation	1	2020	1	2021
Vehicle Protection Suite (VPS) Platform Integration	1	2020	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD				Project (Number/Name) XU9 / Active Protection System			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
XU9: Active Protection System	-	0.000	83.800	42.300	-	42.300	0.000	0.000	0.000	0.000	0.000	126.100
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project XU9 (Active Protection System) is a continuation of efforts previously executed under PE 0203735A - Combat Vehicle Improvement Programs.

A. Mission Description and Budget Item Justification

The Active Protection System effort will install and characterize Non-Developmental Item (NDI) Active Protection Systems on Abrams, Bradley, and Stryker demonstrator vehicles. The Active Protection System effort will assess the maturity, performance, and integration risk of NDI Active Protection Systems, develop and refine Abrams, Bradley, and Stryker Active Protection System installation kit designs, and build prototypes necessary to conduct performance and safety testing to obtain an Active Protection System Urgent Materiel Release (UMR). The Active Protection System NDI effort will also serve to inform the Vehicle Protection Suite Analysis of Alternatives (AoA).

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: Active Protection System (APS) Installation Kit Refinement and System Test - Abrams</p> <p>Description: Funding provided support APS integration and Test support for Abrams</p> <p>FY 2018 Plans: Engineering, logistics, and program management to mature the Abrams APS integration kit design, build Abrams APS prototypes, and execute system performance and safety testing necessary to obtain an Abrams APS Urgent Materiel Release (UMR).</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: At this time there is no FY 2019 requirement for Abrams characterization testing.</p>	-	36.800	-	-	-
<p>Title: Active Protection System (APS) Installation Kit Refinement and System Test - Bradley</p> <p>Description: Funding provided support APS integration and Test support for Bradley</p> <p>FY 2018 Plans: Engineering, logistics, and program management to mature the Bradley APS integration kit design, develop software releases across Bradley vehicle variants to operate the APS, and execute contractor testing of the</p>	-	30.000	26.000	-	26.000

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD	Project (Number/Name) XU9 / Active Protection System

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Vehicle Software Version Updates prior to the execution of system performance and safety testing necessary to obtain a Bradley APS Urgent Material Release (UMR). FY 2019 Base Plans: Continue engineering, logistics, and program management to mature the Bradley Active Protection System (APS) integration kit design, develop software releases across Bradley vehicle variants to operate the APS, and execute contractor testing of the vehicle software version updates prior to the execution of system performance and safety testing necessary to obtain a Bradley APS Urgent Material Release (UMR). FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 effort for characterization testing and initiation of the development of logistics products necessary for UMR will be reduced from FY 2018.					
Title: Active Protection System (APS) Installation Kit Refinement and System Test - Stryker Description: Funding provided support APS integration and Test support for Stryker FY 2018 Plans: Engineering, logistics, and program management to mature the Stryker APS integration kit design, build Stryker APS prototypes, and execute system performance and safety testing necessary to obtain a Stryker APS Urgent Materiel Release (UMR). FY 2019 Base Plans: Continue engineering, logistics, and program management to mature the Stryker APS integration kit design, build Stryker APS prototypes, and execute system performance and safety testing necessary to obtain a Stryker APS Urgent Materiel Release (UMR). FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 effort for characterization testing and initiation of the development of logistics products necessary for UMR will be reduced from FY 2018.	-	17.000	16.300	-	16.300
Accomplishments/Planned Programs Subtotals	-	83.800	42.300	-	42.300

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• GA0700: Abrams Tank (MOD)	492.044	387.526	927.600	34.000	961.600	284.209	289.323	269.175	286.432	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD	Project (Number/Name) XU9 / Active Protection System

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

Line Item	FY 2017	FY 2018	FY 2019	FY 2019	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Cost To	
			Base	OCO	Total					Complete	Total Cost
• GZ2400: Bradley Program (MOD)	265.333	474.851	625.424	50.000	675.424	637.190	663.460	650.662	840.733	Continuing	Continuing
• GM0100: Stryker (Mod)	82.681	97.552	287.490	-	287.490	465.780	570.391	544.979	500.041	Continuing	Continuing

Remarks

FY 2019 OCO funding in GA00700 and GZ2400, supports the procurement of Non-Development Item (NDI) Active Protection System (APS) for installation onto Abrams and Bradley.

D. Acquisition Strategy

The Active Protection System Project (XU9) is a continuation of efforts previously executed under PE 0203735A - Combat Vehicle Improvement Programs.

The Active Protection System (APS) installation and characterization effort will evaluate platform (Abrams, Bradley, Stryker) performance with an Non-Developmental Item (NDI) APS solution installed. Platform performance evaluation includes APS sensor assessments, minimum live threat characterization, surface danger zone characterization, co-site mitigation (antennas/radiators), electromagnetic interference assessment/characterization, energetic radiation assessment, and a durability assessment. The NDI APS installation and characterization is being executed through a partnership between the US Army, NDI APS solution vendors, and prime contractors for Abrams, Bradley, and Stryker vehicles. NDI APS vendor support, to include procurement of demonstration hardware, is contracted on a Firm-Fixed Price (FFP) basis, while platform prime contractor technical support is provided on a Cost Plus Fixed-Fee (CPFF) basis. The results from the installation and characterization effort will inform FY18 decisions to pursue the additional prototyping and testing necessary to obtain Urgent Materiel Releases (UMR) for NDI APS systems.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD	Project (Number/Name) XU9 / Active Protection System
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Active Protection System (APS) Installation Kit Development and Prototype Build - Abrams	SS/ Various	US Army TARDEC; Rafael Advanced Defense Systems; General Dynamics Land Systems (GDLS) : Warren, MI	-	-		23.881	Nov 2017	-		-		-	0.000	23.881	-
Active Protection System (APS) Installation Kit Development and Prototype Build - Bradley	SS/ Various	US Army TARDEC; Israeli Military Industries (IMI); BAE Systems : Warren, MI	-	-		28.948	Jan 2018	4.400	Jan 2019	-		4.400	0.000	33.348	-
Active Protection System (APS) Installation Kit Development and Prototype Build - Stryker	SS/ Various	US Army TARDEC; Artis, LLC.; General Dynamics Land Systems (GDLS) : Warren, MI	-	-		5.183	Jan 2018	4.100	Jan 2019	-		4.100	0.000	9.283	-
Subtotal			-	-		58.012		8.500		-		8.500	0.000	66.512	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 (PMO) Support	MIPR	PEO Ground Combat Systems : Warren, MI	-	-		3.223	Oct 2017	2.600	Oct 2018	-		2.600	0.000	5.823	-
Subtotal			-	-		3.223		2.600		-		2.600	0.000	5.823	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD	Project (Number/Name) XU9 / Active Protection System
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Testing - Abrams Active Protection System (APS)	MIPR	Various : Army Test Centers	-	-		11.464	Nov 2017	-		-		-	0.000	11.464	-
Government Testing - Stryker Active Protection System (APS)	MIPR	Various : Army Test Centers	-	-		11.101	Jan 2018	11.100	Jan 2019	-		11.100	0.000	22.201	-
Government Testing - Bradley Active Protection System (APS)	MIPR	Various : Army Test Centers	-	-		-		20.100	Jan 2019	-		20.100	0.000	20.100	-
Subtotal			-	-		22.565		31.200		-		31.200	0.000	53.765	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		83.800		42.300		-		42.300	0.000	126.100	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD	Project (Number/Name) XU9 / Active Protection System

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Abrams APS Demonstrator Design and Install	[Bar]				[Bar]																							
	Abrams Design/Install																											
Abrams APS Characterization	[Bar]																											
	Abrams Characterization																											
Abrams APS Decision Point (DP) 1 (Production)					▲ 1																							
					Abrams DP1																							
Abrams APS Installation Kit (IK) Refinement, Prototype Build, & Test					[Bar]																							
					Abrams IK Refinement/Prototype Build/Test																							
Abrams APS Production					[Bar]																							
					Abrams Production																							
Bradley APS Demonstrator Design and Install	[Bar]				[Bar]																							
	Bradley Design/Install				Bradley Characterization																							
Bradley APS Characterization					[Bar]																							
					Bradley Characterization																							
Bradley APS Decision Point (DP) 1 (Production)					▲ 3																							
					Bradley DP1																							
Bradley APS Installation Kit (IK) Refinement, Prototype Build, & Test					[Bar]																							
					Bradley IK Refinement/Prototype Build/Test																							
Bradley APS Production					[Bar]																							
					Bradley Production																							
Stryker APS Demonstrator Design and Install	[Bar]				[Bar]																							
	Stryker Design/Install				Stryker Characterization																							
Stryker APS Characterization					[Bar]																							
					Stryker Characterization																							
Stryker APS Decision Point (DP) 1 (Production)					▲ 2																							
					Stryker DP1																							

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD	Project (Number/Name) XU9 / Active Protection System	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Stryker APS Installation Kit (IK) Refinement, Prototype Build, & Test																												
Stryker APS Production																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / Suite of Vehicle Protection Systems - EMD	Project (Number/Name) XU9 / Active Protection System

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Abrams APS Demonstrator Design and Install	3	2016	1	2017
Abrams APS Characterization	1	2017	4	2017
Abrams APS Decision Point (DP) 1 (Production)	1	2018	1	2018
Abrams APS Installation Kit (IK) Refinement, Prototype Build, & Test	1	2018	1	2019
Abrams APS Production	2	2018	1	2020
Bradley APS Demonstrator Design and Install	4	2016	4	2017
Bradley APS Characterization	4	2017	3	2018
Bradley APS Decision Point (DP) 1 (Production)	3	2018	3	2018
Bradley APS Installation Kit (IK) Refinement, Prototype Build, & Test	3	2018	4	2020
Bradley APS Production	4	2018	2	2020
Stryker APS Demonstrator Design and Install	4	2016	3	2017
Stryker APS Characterization	4	2017	2	2018
Stryker APS Decision Point (DP) 1 (Production)	2	2018	2	2018
Stryker APS Installation Kit (IK) Refinement, Prototype Build, & Test	3	2018	2	2019
Stryker APS Production	2	2019	3	2019

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	1.689	1.972	1.781	-	1.781	5.985	7.912	8.240	2.880	0.000	30.459
509: <i>LIGHTWEIGHT 155M HOWITZER</i>	-	1.689	1.972	1.781	-	1.781	5.985	7.912	8.240	2.880	0.000	30.459

A. Mission Description and Budget Item Justification

The Lightweight 155mm Howitzer (LW155), also known as the M777A2, provides direct, reinforcing, general support fires to maneuver forces and direct support artillery. It replaces all howitzers in all missions in the USMC and replaces the M198 howitzer as the general support artillery for light forces in the Army. The LW155 fires unassisted projectiles to a range of 15 miles and assisted projectiles to 19 miles. The addition of the digital fire control system enables the weapon to program and fire the improved Excalibur precision-guided munitions to ranges in excess of 25 miles with better than 10-meter Circular Error Probable (CEP) accuracy. The LW155 is the first ground combat system whose major structures are made of high strength titanium alloy and the system makes extensive use of hydraulics to operate the breech, load tray, recoil and wheel arms. The combination of titanium structures and the use of hydraulic systems resulted in a significant weight savings of 7000 lbs over the M198 system. Compared to the M198, the LW155 emplaces three-times faster and displaces four-times faster. It traverses 32 percent more terrain worldwide and is 70 percent more survivable than the M198. It is a successful joint service program between the Marine Corps and Army working together to develop, produce, field, and sustain the howitzer. The LW155 was first introduced into the Marine Corps in April 2005 and the Marines have now fielded the howitzer to all active units. The Army has fielded the howitzer to its Stryker Brigade Combat teams (SBCT), Fires Brigades and National Guard. Fielding of the Infantry Brigade Combat Teams (IBCT) commenced in FY14 and will continue through 2018. The LW155 saw extensive action in Afghanistan, receiving high marks for its performance. Having now been in the field for over 10 years, the howitzer will be going through obsolescent replacement of electronic components in its digital fire control system.

Funding supports engineering studies for capabilities identified in the Joint U.S. Army, U.S. Marine Corps Operational Requirements Document (JORD) for the Advanced Towed Cannon System but deferred during Engineering Manufacturing and Development due to technology maturity, cost and schedule as well as government sustainment activities requiring RDTE. This includes an extended range cannon; digital direct fire sight; advanced power solutions; electric elevation drives and auto loader to achieve full operational requirements. Efforts in FY2015-FY2018 center on researching technical solutions while efforts in FY2019-FY2023 will involve developing technology demonstrator prototypes.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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 0604854A / <i>Artillery Systems - EMD</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	4.506	1.972	2.312	-	2.312
Current President's Budget	1.689	1.972	1.781	-	1.781
Total Adjustments	-2.817	0.000	-0.531	-	-0.531
• Congressional General Reductions	-0.001	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.066	-			
• Adjustments to Budget Years	-	-	-0.531	-	-0.531
• FY17 Amendment	-2.750	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</i>				Project (Number/Name) 509 / <i>LIGHTWEIGHT 155M HOWITZER</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
509: <i>LIGHTWEIGHT 155M HOWITZER</i>	-	1.689	1.972	1.781	-	1.781	5.985	7.912	8.240	2.880	0.000	30.459
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Lightweight 155mm (LW155) Towed Howitzer is a jointly managed program with the Marine Corps.

A. Mission Description and Budget Item Justification

The Lightweight 155mm Howitzer (LW155), also known as the M777A2, provides direct, reinforcing, general support fires to maneuver forces and direct support artillery. It replaces all howitzers in all missions in the USMC and replaces the M198 howitzer as the general support artillery for light forces in the Army. The LW155 fires unassisted projectiles to a range of 15 miles and assisted projectiles to 19 miles. The addition of the digital fire control system enables the weapon to program and fire the improved Excalibur precision-guided munitions to ranges in excess of 25 miles with better than 10-meter Circular Error Probable (CEP) accuracy. The LW155 is the first ground combat system whose major structures are made of high strength titanium alloy and the system makes extensive use of hydraulics to operate the breech, load tray, recoil and wheel arms. The combination of titanium structures and the use of hydraulic systems resulted in a significant weight savings of 7000 lbs over the M198 system. Compared to the M198, the LW155 emplaces three-times faster and displaces four-times faster. It traverses 32 percent more terrain worldwide and is 70 percent more survivable than the M198. It is a successful joint service program between the Marine Corps and Army working together to develop, produce, field, and sustain the howitzer. The LW155 was first introduced into the Marine Corps in April 2005 and the Marines have now fielded the howitzer to all active units. The Army has fielded the howitzer to its Stryker Brigade Combat teams (SBCT), Fires Brigades and National Guard. Fielding of the Infantry Brigade Combat Teams (IBCT) commenced in FY14 and completed in FY18. The LW155 has seen extensive action in Afghanistan, receiving high marks for its performance. Having now been in the field for over 10 years, the howitzer will be going through obsolescent replacement of electronic components in its digital fire control system.

Funding supports engineering studies for capabilities identified in the Joint U.S. Army, U.S. Marine Corps Operational Requirements Document (JORD) for the Advanced Towed Cannon System but deferred during Engineering Manufacturing and Development due to technology maturity, cost and schedule as well as government sustainment activities requiring RDTE. This includes an extended range cannon; digital direct fire sight; advanced power solutions; electric elevation drives and auto loader to achieve full operational requirements. Efforts in FY2015-FY2018 center on researching technical solutions while efforts in FY2019-FY2023 will involve developing technology demonstrator prototypes.

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

	FY 2017	FY 2018	FY 2019
Title: Management Services	0.199	0.204	0.204
Description: Funding supports management services within the Program Management Office, Towed Artillery Systems			
FY 2018 Plans:			
Funding will support management and coordination with the Armaments Research Development and Engineering Center to conduct modeling, simulation, analysis and trade studies to characterize the M777A2 for performance improvements. The			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</i>	Project (Number/Name) 509 / <i>LIGHTWEIGHT 155M HOWITZER</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
data generated from these efforts will be used to establish a database to support future technology demonstrations focused on achieving current JORD objective capabilities as well as Force 2025 and Beyond Initiatives.			
FY 2019 Plans: Funding will support management and coordination with the Armaments Research Development and Engineering Center to conduct modeling, simulation, analysis and trade studies to characterize the M777A2 for performance improvements. The data generated from these efforts will be used to establish a database to support future technology demonstrations focused on achieving current JORD objective capabilities as well as Force 2025 and Beyond Initiatives.			
Title: Product Development Description: Funds engineering support from the Armaments Research Development and Engineering Center	1.490	1.768	1.577
FY 2018 Plans: Funding will support continued modeling, simulation, and analysis to characterize the objective M777A2 extended range design, analysis, and drawings. Continues XM907 common cannon assembly support and will provide for fabrication of cannon integration components.			
FY 2019 Plans: Funding will support continued modeling, simulation, and analysis to characterize the objective M777A2 extended range design, analysis, and drawings. Funding will provide for start of objective hardware fabrication of cannon integration components as well as engineering effort to integrate cannon components into howitzer platform.			
FY 2018 to FY 2019 Increase/Decrease Statement: Funding decrease from FY2018 to FY2019 is the completion of the XM907 common cannon characterization.			
Accomplishments/Planned Programs Subtotals	1.689	1.972	1.781

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• GZ1700: M777 Mods	33.600	3.985	3.086	-	3.086	2.477	11.408	16.758	17.947	Continuing	Continuing

Remarks
Procurement Funding supports active retrofits and hardware refresh for previously contracted Digital Fire Control System components, addressing obsolescence. FY21, FY22, and FY23 funding procures chrome cannon tubes to address spiral wear and durability issues.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</i>	Project (Number/Name) 509 / <i>LIGHTWEIGHT 155M HOWITZER</i>
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D. Acquisition Strategy

This is a collaborative effort between the Program Management Office, Towed Artillery Systems, and the Armaments Research Development and Engineering Center at Picatinny Arsenal.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army											Date: February 2018				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0604854A / Artillery Systems - EMD				509 / LIGHTWEIGHT 155M HOWITZER							
Management Services (\$ in Millions)					FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total		
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Sub Allot	Program Management Towed Artillery Systems : Picatinny Arsenal, NJ	0.391	0.199	Feb 2017	0.204	Nov 2017	0.204	Nov 2018	-		0.204	Continuing	Continuing	Continuing
Subtotal			0.391	0.199		0.204		0.204		-		0.204	Continuing	Continuing	N/A
Product Development (\$ in Millions)					FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total		
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering	MIPR	Armaments Research & Developmet Center : Picatinny Arsenal, NJ	3.698	1.490	Feb 2017	1.768	Nov 2017	1.577	Nov 2018	-		1.577	Continuing	Continuing	Continuing
Subtotal			3.698	1.490		1.768		1.577		-		1.577	Continuing	Continuing	N/A
Project Cost Totals			4.089	1.689		1.972		1.781		-		1.781	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</i>	Project (Number/Name) 509 / <i>LIGHTWEIGHT 155M HOWITZER</i>
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Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
XM907 Common Cannon Assembly Support	[Redacted]				[Redacted]				[Redacted]																			
Objective M777ER Design, Analysis & Drawings	[Redacted]				[Redacted]				[Redacted]																			
Objective M777ER Component Fabrication	[Redacted]				[Redacted]				[Redacted]																			
Integration	[Redacted]				[Redacted]				[Redacted]																			
Engineering Tests	[Redacted]				[Redacted]				[Redacted]																			
Demonstrator	[Redacted]				[Redacted]				[Redacted]																			
System Demonstration Testing	[Redacted]				[Redacted]				[Redacted]																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / <i>Artillery Systems - EMD</i>	Project (Number/Name) 509 / <i>LIGHTWEIGHT 155M HOWITZER</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
M777 Engineering Tools Development & Validation	1	2015	2	2016
XM907 Common Cannon Assembly Support	1	2015	2	2019
Objective M777ER Design, Analysis & Drawings	1	2015	1	2019
Objective M777ER Component Fabrication	2	2018	3	2019
Integration	2	2019	3	2020
Engineering Tests	3	2020	4	2020
Demonstrator	1	2021	1	2021
System Demonstration Testing	1	2021	3	2022

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	70.104	81.776	113.758	-	113.758	100.831	75.091	65.610	47.010	0.000	554.180
099: <i>Army Human Resource System</i>	-	4.496	16.607	3.367	-	3.367	0.807	0.208	0.208	0.207	0.000	25.900
184: <i>Installation Support Modules</i>	-	1.205	1.520	2.505	-	2.505	1.503	1.411	1.278	1.295	0.000	10.717
193: <i>Medical Communications For Combat Casualty</i>	-	1.160	0.390	4.404	-	4.404	2.363	1.533	1.563	1.595	0.000	13.008
738: <i>AcqBiz</i>	-	5.422	9.118	41.032	-	41.032	42.409	30.190	18.223	13.682	0.000	160.076
FE9: <i>ALTESS (P&R Forms)</i>	-	0.112	0.110	0.112	-	0.112	0.000	0.000	0.000	0.000	0.000	0.334
T04: <i>USMEPCOM TRANSFORMTION - IT MODERNIZATION</i>	-	28.043	11.217	21.598	-	21.598	15.235	8.214	8.292	0.000	0.000	92.599
T05: <i>Army Business System Modernization Initiatives</i>	-	29.666	39.216	37.714	-	37.714	35.419	30.376	32.824	26.963	0.000	232.178
VR3: <i>ASMIS-R (REPORTIT)</i>	-	0.000	3.598	3.026	-	3.026	3.095	3.159	3.222	3.268	0.000	19.368

Note

Army Safety Management Information System - Revised (ASMIS-R) funding was realigned from PE 0605013, Project T05 to PE 0605013, Project VR3 for greater transparency in FY 2018.
 ALTESS (P&R Forms) funding was realigned from PE 0605013, Project 738 to PE 0605013, Project FE9 for greater transparency in FY 2018.

A. Mission Description and Budget Item Justification

This program supports efforts to plan, design, develop, and test information technology solutions to fulfill the Army's Warfighter Support Mission and accommodate changing Army requirements while fulfilling future Army needs. Provides for development and acquisition of Combat Service Support (CSS) and business information technology solutions to help arm, sustain, fix, move, train and man the force. Completed development/acquisition efforts will also enhance sustaining base functions and power projection capabilities and facilitate global messaging and electronic data interchange (EDI). Ongoing development efforts support multiple functional areas including logistics, personnel, transportation, training, medical/health protection, and the sustaining base.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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 0605013A / <i>Information Technology Development</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	74.236	81.776	116.915	-	116.915
Current President's Budget	70.104	81.776	113.758	-	113.758
Total Adjustments	-4.132	0.000	-3.157	-	-3.157
• Congressional General Reductions	-0.035	-			
• Congressional Directed Reductions	-0.504	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.851	-			
• SBIR/STTR Transfer	-2.742	-			
• Adjustments to Budget Years	-	-	-3.157	-	-3.157

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>				Project (Number/Name) 099 / <i>Army Human Resource System</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
099: <i>Army Human Resource System</i>	-	4.496	16.607	3.367	-	3.367	0.807	0.208	0.208	0.207	0.000	25.900
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2019 Base funding in the amount \$3.367 million in support of Army Human Resource Systems (AHRS) continues to provide the Warfighter with state of art standardized systems that assist the Combatant Commander sustain, train, equip, deploy and account for personnel in and out of Theater. Systems include the Deployed Theater Accountability System, Range Facility Maintenance Support System and the electronic Military Personnel System.

A. Mission Description and Budget Item Justification

This project funds the Personnel Transformation - Enterprise Service Bus and GoArmyEd.

- Personnel Transformation (PT) - Enterprise Service Bus (ESB) - The Army's Enterprise Service Bus (ESB) provides a data integration service in which data can be extracted from the legacy human resource systems and transferred to DIMHRS. The ESB will be a middleware application which will provide a single interface to and from the Defense Integrated Military Human Resources System (DIMHRS) from the Army Legacy Systems. The ESB will provide the infrastructure for the integration of new and existing applications by allowing systems and applications to easily exchange information across different environments and platforms. It will also form the information bridge between the Integrated Personnel and Pay System - Army (IPPS-A) , the Army Legacy Systems, and external systems to create more streamlined systems in support of the military mission and personnel transformation goals.

- GoArmyEd is an Army Continuing Education System (ACES) program that provides the virtual gateway for soldiers to request Tuition Assistance (TA) and Department of the Army (DA) civilians to request training funds online, anytime for classroom, distance learning, and online college courses. GoArmyEd is a dynamic online portal that automates many of the paper-based processes historically conducted in-person at Army Education Centers. GoArmyEd includes automated registration tools that enforce TA policies and procedures. GoArmyEd is used by authorized users to pursue their post secondary educational goals: Army Education Counselors to provide educational guidance; CPMS and TMs to manage civilian training and Colleges to deliver degree and course offerings and to report user progress.

Modernization initiatives address continued improvements related to the integration of new users and decreasing reliance on the help desk. GoArmyEd is the Army's enterprise education solution. GoArmyEd has integrated the Reserve Component (USAR and National Guard) and the Department of the Army Civilians. In addition, GoArmyEd is working to add a new data warehouse for HQ data retrieval and user self help tools. Education benefits are paramount to recruiting and retention of quality Soldiers, Civilians and Families.

Commanders Risk Reduction Dashboard (CRRD) began with the identification of capability gaps arising out of the 2010 Red Book and 2012 Gold Book, two extensive studies directed by senior army leadership to examine suicide prevention (Red Book) and the Army's health and discipline (Gold Book). The studies illustrated that Commanders faced capability gaps in their ability to identify high risk behavior and risk factors, analyze soldier and unit risk, and identify risk trends and develop intervention strategies. CRRD is capable of tracking high risk behavior patterns within a Commander's unit, coupled with a complete picture of high risk behavior of

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018			
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 099 / <i>Army Human Resource System</i>			
individuals will allow Commanders to take a more proactive mitigation approach through unit level training as well as individual interventions. The implementation of the CRRD will decrease the number of resources and steps involved in gathering data and providing Commanders with risk related information.					
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Army Human Resource System (AHRS) Description: Funding will support continued enhancement/automation of the software functionality. FY 2018 Plans: GoArmy Ed will add functionality, continue automation of manual business processes, and add a virtual self help tool, data hosting of GoArmy Ed at Human Resources Command (HRC). FY 2018 to FY 2019 Increase/Decrease Statement: Funding zeroed out in FY 2019.	-	1.730	-	-	-
Title: Commanders Risk Reduction Dashboard (CRRD) Description: Commanders Risk Reduction Dashboard will consolidate information from multiple Army databases and present to commanders a concise report about which soldiers in their units have been involved with at-risk behaviors, some of which may be associated with suicide, and when those instances occurred. FY 2018 Plans: During FY 2018 CRRD will complete development, conduct developmental testing, user experience experiments, system integration testing, performance testing, operational testing, interoperability certification testing, and cybersecurity testing and accreditation. FY 2019 Base Plans: The CRRD tool will provide a single dashboard of information that identified potential attributes that increase the risk of suicide. The dashboard will provide Commanders in all Army components with the capability to obtain information regarding the soldier?s previous disciplinary actions, both civilian and UCMJ as well as the information regarding the health of the Soldier. This information will enable the Commander to gain additional inputs on the Soldier?s background, allowing the Commander to adjust their leadership and counseling approach to improve the Soldier?s wellbeing therefore increasing their ability to perform their duties. FY 2018 to FY 2019 Increase/Decrease Statement: The FY 2019 decrease is the result of projected funding for \$3.068 to be received within project line T05 - Army Business Systems Modernization.	3.992	3.320	0.154	-	0.154
Title: VACE	0.504	11.557	3.213	-	3.213

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 099 / <i>Army Human Resource System</i>

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Description: VACE					
FY 2018 Plans: Performance Work Statement development, acquisition strategy and market research were all conducted in FY 2016/17 in anticipation of FY 2018/19 development of Modern GoArmyEd system. Sole source contract was also initiated to allow existing GoArmyEd system to continue to operate from IBM Federal Data center until Modern GoArmyEd system is operational.					
FY 2019 Base Plans: Performance Work Statement development, acquisition strategy and market research were all conducted in FY 2016/17 in anticipation of FY 2018/19 development of Modern GoArmyEd system. Sole source contract was also initiated to allow existing GoArmyEd system to continue to operate from IBM Federal Data center until Modern GoArmyEd system is operational.					
FY 2018 to FY 2019 Increase/Decrease Statement: Project development near completion.					
Accomplishments/Planned Programs Subtotals	4.496	16.607	3.367	-	3.367

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• W00800: GCSS-A Inc 1	131.434	30.637	7.085	-	7.085	6.944	0.068	0.024	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

GoArmyEd - The program manager makes extensive use of Integrated Product Teams (IPTs). Sub-elements of the acquisition (engineering and design, logistics planning, testing, etc.) are intensively managed by integrated teams of government and contractor personnel. Task performance is tracked against the Work Breakdown Structure (WBS) and resources allocated to each task are adjusted based on performance against the WBS. GoArmyEd contractual efforts are acquired on a firm fixed price basis on existing contractual vehicles.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 099 / <i>Army Human Resource System</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Product Development	C/FFP	Acquisition Contract Center : Rock Island, II	1.519	-		-		-		-		-	0.000	1.519	-
Subtotal			1.519	-		-		-		-		-	0.000	1.519	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
AHRS - ECPs/SCPs/ICPs	C/FFP	Hewlett Packard : various	89.251	-		-		-		-		-	0.000	89.251	-
AHRS - Software Development	C/FFP	Hewlett Packard : various	51.723	-		-		-		-		-	0.000	51.723	-
GoArmyEd	C/FFP	IBM : Various	7.248	0.504		-		-		-		-	Continuing	Continuing	-
CRRD	C/FFP	PEO EIS : FT Belvoir VA	1.314	3.992		16.607		3.367		-		3.367	0.000	25.280	-
Subtotal			149.536	4.496		16.607		3.367		-		3.367	Continuing	Continuing	N/A

Remarks
 AHRS Software Development contract for CRRD FY 2017 is TBD; estimated value is \$4.900 million, contract method is Firm Fixed Price (FFP). Commanders Risk Reduction Dashboard will consolidate information from multiple Army databases and present to commanders a concise report about which soldiers in their units have been involved with at-risk behaviors, some of which may be associated with suicide, and when those instances occurred.

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		151.055	4.496	16.607	3.367	-	3.367	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 099 / <i>Army Human Resource System</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
GoArmyEd Support/Enhancements																												
Commanders Risk Reduction Dashboard (CRRD) Enhancements																												
Commanders Risk Reduction Dashboard (CRRD) Development																												
Develop CRRD																												
Support/Enhancements																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 099 / <i>Army Human Resource System</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Migration of AHRS eMILPO functionality into IPPS-A	3	2006	4	2012
eMILPO Support/Enhancements	4	2003	4	2012
DTAS Support/Enhancements	4	2004	4	2012
IPPS-A	3	2008	4	2012
Tactical Personnel System (TPS) Support/Enhancements	1	2006	4	2012
GoArmyEd Support/Enhancements	1	2013	4	2017
Commanders Risk Reduction Dashboard (CRRD) Enhancements	1	2019	4	2025
Commanders Risk Reduction Dashboard (CRRD) Development	3	2015	4	2018

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>				Project (Number/Name) 184 / <i>Installation Support Modules</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
184: <i>Installation Support Modules</i>	-	1.205	1.520	2.505	-	2.505	1.503	1.411	1.278	1.295	0.000	10.717
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Installation Support Modules (ISM) consists of four standardized, web based, custom-developed enterprise wide applications that integrate essential installation business practices and processes throughout the Army, to meet Army Force Generation (ARFORGEN) Brigade Combat Team readiness and deployment requirements. Three modules support human resources business functions (In/Out-Processing, Transition Processing, and Personnel Locator); the fourth module, Central Issue Facility (CIF) supports management of over \$9 billion combatant Organizational Clothing and Individual Equipment inventory. The web server architecture is fully internet protocol capable and allows soldiers ready access to their records and commanders and logisticians access to information affecting readiness of combat organizations.

Coalition Warfighter Interoperability Demonstration (CWID) is a mandated Joint program that requires participation by the US Army to explore near-term technologies that support Joint and Coalition Warfare Interoperability. Funding is to facilitate Coalition Force interoperability research and development and to comply with CJCSI 6230.2 date 30 April 05.

Army Behavioral Health Integrated Data Environment (ABHIDE) will be the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) Suicide Registry. Data relating to suicides and suicide attempts are collected and stored in disparate, non-related databases that cross the domains of medical, personnel and law enforcement. ABHIDE will provide the capability of integrating the non-related and dispersed data from the separate sources into a single comprehensive database to support both retrospective and predictive analysis. The information obtained will be used to conduct epidemiological surveillance, identify trends in behavior patterns and identify potential indicators for suicidal tendencies supporting the mitigation of future suicide attempts across all phases of Army service.

ISM Core funding is essential for supporting demands to research and develop improved systems to provide for soldier safety and inventory reduction without risking readiness. Funding supports research and development to comply with Department of Defense Instruction 8320.4 Serialized Item Management. Applications to use commercial off the shelf wireless bar code equipment to ensure inventory accuracy throughout 154 warehouses in worldwide locations potentially reduces operating costs by \$500.0 million.

FY 2019 Base funding in the amount of \$2.505 million will continue to facilitate Coalition Force interoperability research and development Coalition Warfighter Interoperability Demonstration (CWID) and will continue development of the Army Behavioral Health Integrated Data Environment (ABHIDE) system.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Army Behavioral Health Integrated Data Environment	1.205	1.520	2.505	-	2.505

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 184 / <i>Installation Support Modules</i>

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: Army Behavioral Health Integrated Data Environment (ABHIDE) will be the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) Suicide Registry.</p> <p>FY 2018 Plans: Army Behavioral Health Integrated Data Environment (ABHIDE) will be the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) Suicide Registry. Data relating to suicides and suicides attempts are collected and stored in a in disparate, non-related databases that cross the domains of medical, personnel and law enforcement. ABHIDE will provide the capability of integrating the non-related and dispersed data from the separate sources into a single comprehensive database to support both retrospective and predictive analysis. The information obtained will be used to conduct epidemiological surveillance, identify trends in behavior patterns and identify potential indicators for suicidal tendencies supporting the mitigation of future suicide attempts across all phases of Army service.</p> <p>FY 2019 Base Plans: Army Behavioral Health Integrated Data Environment (ABHIDE) will be the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) Suicide Registry. Data relating to suicides and suicides attempts are collected and stored in a in disparate, non-related databases that cross the domains of medical, personnel and law enforcement. ABHIDE will provide the capability of integrating the non-related and dispersed data from the separate sources into a single comprehensive database to support both retrospective and predictive analysis. The information obtained will be used to conduct epidemiological surveillance, identify trends in behavior patterns and identify potential indicators for suicidal tendencies supporting the mitigation of future suicide attempts across all phases of Army service.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Continued system development.</p>					
Accomplishments/Planned Programs Subtotals	1.205	1.520	2.505	-	2.505

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• BE4162: <i>MACOM AUTOMATION SYSTEMS (BE4162)</i>	30.870	43.069	133.513	9.353	142.866	143.760	111.007	104.966	37.600	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 184 / <i>Installation Support Modules</i>

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
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Remarks

D. Acquisition Strategy

Installation Support Modules is in Post Deployment Software Support (PDSS). The present concept calls for the use of full and open competition to implement enhancements as defined by the Functional Proponent, Army Chief Information Officer (CIO). Current emphasis is to bring the ISM systems to functional readiness for transfer to an Army Data Center and virtualize the ISM systems.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 184 / <i>Installation Support Modules</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Behavioral Health Integrated Data Environment	C/FFP	various : various	5.581	1.205		1.520		2.505		-		2.505	Continuing	Continuing	-
Post-Deployment Software Support (PDSS)	C/FFP	various : various	6.061	-		-		-		-		-	0.000	6.061	-
Coalition Warfighter Interoperability Demonstration (CWID)	C/TBD	various : various	0.091	-		-		-		-		-	0.000	0.091	-
Subtotal			11.733	1.205		1.520		2.505		-		2.505	Continuing	Continuing	N/A

Remarks
Post Deployment Software Support (PDSS) continues through 2025 as the Central issue Facility module evolves with changes in OCIE requirements.

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Independent Verification and Validation (IVV) Testing	C/T&M	GDIT Corp : various	2.111	-		-		-		-		-	0.000	2.111	-
Subtotal			2.111	-		-		-		-		-	0.000	2.111	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		13.844	1.205		1.520		2.505		-	2.505	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>		Project (Number/Name) 184 / <i>Installation Support Modules</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023											
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
ISM Post Deployment Software Support																																				

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 184 / <i>Installation Support Modules</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ISM Post Deployment Software Support	4	2003	4	2020

Note

ISM Core requirements are less than \$1.0 million.

There are no OCO requirements. End date is revised to 30 SEP 2025. Schedule Detail should show ISM System Post Deployment in 2020 1Q - 4Q.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>				Project (Number/Name) 193 / <i>Medical Communications For Combat Casualty</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
193: <i>Medical Communications For Combat Casualty</i>	-	1.160	0.390	4.404	-	4.404	2.363	1.533	1.563	1.595	0.000	13.008
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Medical Communications for Combat Casualty Care (MC4) System interfaces Force Health Protection and medical surveillance information with Army Mission Command information technology systems. The MC4 System fulfills the requirements highlighted in United States Code: Title 10, Subtitle A, Part II, Chapter 55, Section 1074f, mandating the proper documentation of deployed Service members' medical treatment to include pre- and post-deployment screening and its associated medical surveillance. The MC4 System supports other Soldier protection initiatives by providing data for analyses which can be used for identification and development of critical soldier support systems such as body armor, improved helmets, traumatic brain injury protection and trauma reduction. Current MC4 Program efforts are focused on system engineering, testing, integration, and fielding automation infrastructure for Army users of the Theater Medical Information Program-Joint (TMIP-J) suite of software. Effort has also been initiated to integrate MC4 with the Army Chief Information Office (CIO) Network 2020 and Common Operating Environment (COE) and as a program of record in the Mobile/Handheld Computing Environment Working Group. Funding provides engineering, developmental testing, and integration of information management/information technology to support Force Health Protection in accordance with the Army Equipment Modernization Plan.

FY 2019 Base funding in the amount of \$4.404 million will be used for the engineering effort required to evaluate initiatives that improve the performance of the Defense Health Medical Systems (DHMS) Electronic Health Record software on the Army platform, as well as the engineering effort for other Army unique capabilities. Activities include:

- Research of technologies to integrate electronic health record software into Army future information infrastructure
- Compliance with emerging Army network and cloud computing requirements (Army Cloud Computing Strategy and Common Operating Environment)
- Evaluate and test new hardware solutions to meet evolving mission requirements and replace obsolete equipment
- Develop and test hardware solutions for Army unique capability requirements (Point of Injury, Store and Forward, Telehealth, etc.)
- Coordinate research and development activities with Research partners (United States Army Medical Research Materiel Command and United States Army Research, Development and Engineering Command)

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Engineering and Technical Support	0.940	0.370	3.173	-	3.173
Description: Engineering and Technical Support for Preplanned Program Improvements and System Upgrades, Systems Integration, Software Support and other new initiatives to improve system performance and effectiveness. Effort includes rapid integration of new IT technologies as they become available at Technology					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 193 / <i>Medical Communications For Combat Casualty</i>

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Readiness Levels (TRL) 6 or beyond, and engineering effort to modify system parameters due to cybersecurity or other pressing need.</p> <p>FY 2018 Plans: Continued evaluation and development of virtualization, interface/integration with Common Operating Environment as relevant to MC4 system to procure and field objective electronic health record capability.</p> <p>FY 2019 Base Plans: Evaluation and development of hardware solutions to replace obsolete handheld device, integration with Nett Warrior hardware/software in the Common Operating Environment, engineering and technical support for spiral development of Tele-Health capability and integration into electronic health record. Continued development of virtualization and cloud computing environment of electronic health record system to reduce cost and improve system effectiveness.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Theater Medical Information Program-Joint software (legacy joint electronic health record system) reaches final objective in FY 2018. Funding for FY 2018 completes test and integration of objective system for final procurement and fielding. JROC approval of Joint Initial Capabilities Document (ICD) (FY 2016) and Capability Development Document (CDD) (FY 2017), and Army staffing of ICD (FY 2017) for modernized electronic health record system (Joint Operational Medical Information System Increment 1 [J11]) created a requirement, beginning in FY 2019, to research, develop and test new hardware and architecture solutions to effectively implement the new modernized system, complying with Army Common Operating Environment and cloud computing directives and to refine Army deployment architecture.</p>					
<p>Title: PMO Testing Support</p> <p>Description: Test augmentation by outside agencies to include test efforts for DHMS/TMIP-J and other Army unique software capabilities.</p> <p>FY 2018 Plans: Support to complete all test documentation required to obtain materiel release for final objective TMIP-J system .</p> <p>FY 2019 Base Plans: Test augmentation by outside agencies to support pilot testing of new point of injury hardware device prior to procurement and deployment.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p>	0.020	0.005	0.200	-	0.200

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 193 / <i>Medical Communications For Combat Casualty</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Theater Medical Information Program-Joint software (legacy joint electronic health record system) reaches final objective in FY18. Funding for FY18 completes test and integration of objective system for final procurement and fielding. JROC approval of Joint Initial Capabilities Document (ICD) (FY16) and Capability Development Document (CDD) (FY17), and Army staffing of ICD (FY17) for modernized electronic health record system (Joint Operational Medical Information System Increment 1 [J11]) created a requirement, beginning in FY19, to research, develop and test new hardware and architecture solutions to effectively implement the new modernized system, complying with Army Common Operating Environment and cloud computing directives and to refine Army deployment architecture. Support from the test community will be required beginning in FY19 to support testing efforts related to modernized system.					
Title: MC4 Electronic Health Record Integration and Testing Description: Development testing of DHMS Electronic Health Record software; Lab site studies with technology and scenarios; Integration testing of software systems on the MC4 baseline system; test and evaluation of new capabilities for combat theater functionality. FY 2018 Plans: Plan pilot test for capability provided by new point of injury hardware device to replace obsolete equipment and meet system requirement FY 2019 Base Plans: Continue pilot test and test documentation of capability provided by new point of injury hardware device to replace obsolete equipment and meet system requirement. Pilot test to be completed prior to procurement and deployment decisions. FY 2018 to FY 2019 Increase/Decrease Statement: Theater Medical Information Program-Joint software (legacy joint electronic health record system) reaches final objective in FY 2018. Funding for FY 2018 completes test and integration of objective system for final procurement and fielding. JROC approval of Joint Initial Capabilities Document (ICD) (FY 2016) and Capability Development Document (CDD) (FY 2017), and Army staffing of ICD (FY 2017) for modernized electronic health record system (Joint Operational Medical Information System Increment 1 [J11]) created a requirement, beginning in FY 2019, to research, develop and test new hardware and architecture solutions to effectively implement the new modernized system, complying with Army Common Operating Environment and cloud computing directives and to refine Army deployment architecture.	0.200	0.015	1.031	-	1.031
Accomplishments/Planned Programs Subtotals	1.160	0.390	4.404	-	4.404

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 193 / <i>Medical Communications For Combat Casualty</i>

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2019</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• MA8000: <i>Family of Med Comm for Combat Casualty Care</i>	19.893	15.964	25.177	-	25.177	23.877	23.545	24.509	25.002	0.000	157.967
• 432612000: <i>OMA PE 432612</i>	3.467	3.464	2.359	-	2.359	4.917	4.396	2.522	2.573	0.000	23.698
• 435107000: <i>OMA CIVPAY 435107</i>	-	-	3.753	-	3.753	3.825	3.902	3.985	4.069	0.000	19.534

Remarks

MA8000 funding as of OPA Annex AF2.0 dated 22 Dec 2017

D. Acquisition Strategy

The MC4 Program supports a number of Army Medical Information Technology/Communications initiatives. The near and mid-term focus of the MC4 program is to engineer, design, integrate, test, acquire and field the Army automation infrastructure capabilities supporting fielding of the Defense Healthcare Management Systems Electronic Health Record integrated software application suite, future modernized capability, and other Army requirements. The MC4 hardware is procured as Commercial-off-the-Shelf (COTS) components. Since Electronic Health Record software is a major component of the MC4 System and being developed in increments by the Joint Program, the MC4 Program will deliver capabilities in increments, recognizing the need for future system updates and planned upgrades. The MC4 Program works with the user community to continually define and refine additional requirements and match them with available technologies to provide the user enhanced capabilities. These enhanced capabilities will be provided to the user at the earliest possible date. This approach yields the most operationally useful and supportable capability in the shortest time possible with Cost As an Independent Variable. Moreover, this approach provides an initial capability with the explicit intent of delivering improved and updated capability in subsequent updates and planned upgrades. This evolutionary development approach will be accomplished through a rapid prototyping process that will progress the system from its current functional capabilities to fully integrated objective capabilities, and forward into the future with a fully modernized system. Appropriate commercial technology enhancements (e.g. advances in operating systems, voice activated technology, cloud computing capability environment, etc.) will be incorporated into MC4 products and systems as they become available. Each MC4 System component will undergo a full range of developmental testing to include software unit testing, integration testing, interoperability testing and software qualification testing. The MC4 system updates and planned upgrades will continue to undergo follow-on testing.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 193 / <i>Medical Communications For Combat Casualty</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Prog Mgmt Operations	Various	PMO : various	8.405	-		-		-		-		-	0.000	8.405	-
Subtotal			8.405	-		-		-		-		-	0.000	8.405	N/A

Remarks
Funding (Prior Years) in Program Management Operations includes direct pay of PMO government employees, TDY, training, supplies, etc. in direct support of RDTE effort. At Milestone C, Program Management Operations efforts were moved to another appropriation.

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 & Tech Spt/ Information Assurance (old contract)	Various	L-3 (was Titan) : various	9.390	-		-		-		-		-	0.000	9.390	-
Engineering & Tech Spt (new contract)	Various	CACI (was L-3) : Various	5.078	1.140	Jan 2017	0.385	Jan 2018	4.204	Jan 2019	-		4.204	0.000	10.807	-
Information Assurance	Various	ISEC Support : AZ	1.783	-		-		-		-		-	0.000	1.783	-
Subtotal			16.251	1.140		0.385		4.204		-		4.204	0.000	21.980	N/A

Remarks
Information Assurance (IA) activities moved from ISEC to L3 in FY12, IA activities moved to another appropriation FY13; FY15 new competitive contract award, base year with 4 option years (option year awards in January). Final objective Theater Medical Information Program-Joint (TMIP-J) software is expected to be complete and ready for fielding 2QFY18. Modernization of TMIP-J software by Joint program (Joint Operational Medical Information System [JI1]) is currently in process, requiring continued engineering and technical support to ensure an operational system for Army use.

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
PMO Testing Spt	MIPR	ATEC/AMEDD Board/JITC : various	6.736	0.020		0.005		0.200		-		0.200	0.000	6.961	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 193 / <i>Medical Communications For Combat Casualty</i>
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
MC4/TMIP System Engineering	C/T&M	L-3 Communications : Frederick MD	7.889	-		-		-		-		-	0.000	7.889	-
MC4/TMIP System Engineering	Various	John Hopkins University (JHU) Applied Physics Lab : MD	32.124	-		-		-		-		-	0.000	32.124	-
MC4/TMIP System Engineering (new contract)	C/T&M	CACI (was L-3 Communications) : Frederick MD	3.639	-		-		-		-		-	0.000	3.639	-
Subtotal			50.388	0.020		0.005		0.200		-		0.200	0.000	50.613	N/A

Remarks
PMO Testing Spt is provided by other Government agencies (AMEDD Board, ATEC and others).

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	75.044	1.160	0.390	4.404	-	4.404	0.000	80.998	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 193 / <i>Medical Communications For Combat Casualty</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023								
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4					
MC4/TMIP-J I2R3 Fielding Decision					▲ 1																												
System Updates	[Redacted]				[Redacted]																												
Engineering and Technical Support	[Redacted]																																
MC4/TMIP-J Limited User Test and Test Documentation	[Redacted]																																
Joint modernized software JI1 provided to Services to begin fielding																													▲ 2				

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 193 / <i>Medical Communications For Combat Casualty</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Planned Upgrades	1	2007	1	2016
MC4 Development/Integration Testing for TMIP-J I2R2	2	2012	3	2013
MC4/TMIP-J I2R2 MultiService Operational Test & Evaluation	3	2013	1	2014
MC4 Development/IntegrationTesting for TMIP-J I2R3	1	2014	3	2015
MC4/TMIP-J I2R3 MultiService Operational Test & Evaluation	4	2015	1	2016
MC4/TMIP-J I2R3 Fielding Decision	2	2018	2	2018
System Updates	1	2007	1	2019
Engineering and Technical Support	1	2007	1	2024
MC4/TMIP-J Limited User Test and Test Documentation	2	2017	4	2017
Joint modernized software JI1 provided to Services to begin fielding	4	2022	4	2022

Note

Planned Upgrades correspond to current TMIP-J Acquisition Strategy schedules for upgrades and enhanced capability of the TMIP software. System Updates correspond to projected software change packages, to include security enhancements, throughout this time period. Both Upgrades and Updates require integration and testing prior to acceptance and release. Engineering and Technical support continues throughout this time period and is focused on hardware architecture development and technology insertions for the modernized electronic health record system. The modernized electronic health record system, Joint Operational Medical Information System (JOMIS) Increment 1 (JI1) software, being developed by Defense Health Medical Systems, is expected to attain full deployment decision and provided to the Services in 4QFY22 to begin initial fielding.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>				Project (Number/Name) 738 / <i>AcqBiz</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
738: <i>AcqBiz</i>	-	5.422	9.118	41.032	-	41.032	42.409	30.190	18.223	13.682	0.000	160.076
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2019 funding for ACQBIZ/Integrated Program Management Environment (IPME) was transferred to 0605803A.

A. Mission Description and Budget Item Justification

PL AcqBusiness provides acquisition-centric enterprise solutions. Delivers innovative and adaptive solutions that streamline the collection and analysis of data to support powerful decisions across the Army acquisition enterprise. PL AcqBusiness will be the premier source of information technology solutions that enable information dominance at all levels of the Army acquisition enterprise. PL AcqBusiness provides Army Acquisition practitioners with a consistent set of unique business tools, web services, and decision support tools integrated through a common architecture, which provide visibility of authoritative data, consistency in business process, and more timely support to acquisition decisions. The enterprise tools provided via PM AcqBusiness enable the reduction and eventual elimination of stovepipe and redundant tools that exist in the domain today. PL AcqBusiness provides an environment that enables centralized, role-based access to trusted and authoritative data from disparate Acquisition Domain data sources. In addition, PL AcqBusiness provides a framework for information providers to publish their data and provide their services to authorized users.

The funding in this program element also funds the development requirements for the Human Resources Command, U.S. Army Accessioning Integrated Automation Architecture which provides the Information Technology solution necessary to accomplish the Army's Accessioning mission.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Program Management	3.008	5.957	41.032	-	41.032
Description: This effort provides program management in support of the U.S. Army Accessing Integrated Automation Architecture mission.					
FY 2018 Plans: Continue efforts develop RIE/ARISS.					
FY 2019 Base Plans: Army HRC will continue efforts for ARISS, CCIMM and JCIMS for Financial Audit Readiness Requirement and technical requirements gathering, analysis and documentation to allow Readiness Requirement and technical requirements gathering, analysis and documentation. Development requirements for the Army Human Resources Command which provides the IT solution necessary to accomplish the Army's Accessioning mission and support development of the Accessioning Information Environment (AIE) /Recruitment Information					

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 738 / <i>AcqBiz</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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Environment (RIE) development. The Program Executive Office -Enterprise Information Systems was designated as the OPR for AIE effective 11 Oct 17 and funds will be transferred pending approval of Schedule 8 during POM 20-24.

FY 2018 to FY 2019 Increase/Decrease Statement:
AIE is an Enterprise level IT modernization effort to improve efficiency and effectiveness of the Army's Talent Acquisition workforce. The initiative will provide enterprise level capability with transparency, efficiency, effectiveness and greater mobility to acquire the best-qualified talent to meet Army manning requirements

Title: Design, Development, and Test

Description: This effort supports the sunset of the ACQBIZ system to the hosting of Integrated Program Management Environment (IPME) in a commercial cloud environment.

FY 2018 Plans:
PdM AcqBusiness funds will support the integration of COTS SW solutions (tentatively referred to as PM Tools) that provide authoritative, visible, accessible, understandable, trusted, and interoperable data in an Acquisition Data Warehouse (ADW) down to the ACAT III program level through the optimization of Product/Project Manager business processes. Increment 1 of the new Army Acquisition Domain Data Management (AADDM) capability will focus on programmatic information such as Integrated Master Schedules (IMS), cost and budget, industrial base and contractor information. Increment II will then begin the connection of live, authoritative Army databases to the Acquisition data warehouse. Once the business processes and external data sources are providing the data: visualization tools can be utilized to provide key charts/views that support Army Staff (ARSTAFF) processes such as Program Objective Memorandum (POM), Weapon System Review (WSR), Strategic Portfolio Analysis and Review (SPAR), and budget execution drills. Supporting efforts include business process evaluation and definition to maximize efficiency of the Software integration process. Completion of Increment I PM Tools software integration, demonstration and evaluation of the PM Tools in a 6-9 month pilot event within a minimum of one PEO. Funding also supports further acquisition integration of external data sources as required. Further focus will concentrate on delivering more common data views and analytical capabilities to support decision making at Product Manager (PdM), Program Manager (PM), Program Executive Officer (PEO), ASA (ALT), and at ARSTAFF levels. Key events include the PM Tool pilot evaluation and a FP Tool deployment decision by the Milestone Decision Authority (MDA).

	2.414	3.161	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 738 / <i>AcqBiz</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Human Resources Command will continue effort for CCIMM and JCIMS for Financial Audit Readiness Requirement and technical requirements gathering, analysis and documentation to allow TRADOC to conduct the Analysis of Alternatives for the RIE.					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Beginning in FY 2019 funding for ACQBIZ/Integrated Program Management Environment (IPME) was transferred to 0605803A.					
Accomplishments/Planned Programs Subtotals	5.422	9.118	41.032	-	41.032

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 432615000: <i>Operations and Maintenance</i>	10.542	8.294	8.511	-	8.511	8.738	8.977	9.224	-	0.000	54.286

Remarks

D. Acquisition Strategy
The ACQBIZ system will sunset and Integrated Program Management Environment (IPME) will be sustained in a commercial cloud environment in FY19. (APE 655013738 TO APE 0605803A)

E. Performance Metrics
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 738 / <i>AcqBiz</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support	Option/FFP	ACC : Rock Island, IL	20.174	-		5.957		41.032		-		41.032	Continuing	Continuing	Continuing
Subtotal			20.174	-		5.957		41.032		-		41.032	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Analysis and Design, Development, Integration	TBD	TBD : TBD	80.052	5.422	Aug 2017	3.161		-		-		-	Continuing	Continuing	Continuing
Subtotal			80.052	5.422		3.161		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
		Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date						
Project Cost Totals		100.226		5.422		9.118		41.032		-		41.032	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>		Project (Number/Name) 738 / <i>AcqBiz</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Technical Prototyping & Component Integration	Integration & Benefits Assessments																											
Major or Minor Release FY17					▲ 1																							
Sustainment FY18	Continuous																											
Sunset ACQBIZ System FY19									▲ 2																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) 738 / <i>AcqBiz</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Technical Prototyping & Component Integration	1	2006	4	2018
Major or Minor Release FY17	4	2017	4	2017
Sustainment FY18	1	2006	4	2018
Sunset ACQBIZ System FY19	4	2018	4	2018

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) FE9 / <i>ALTESS (P&R Forms)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FE9: <i>ALTESS (P&R Forms)</i>	-	0.112	0.110	0.112	-	0.112	0.000	0.000	0.000	0.000	0.000	0.334
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The P&R Forms application supports the creation and production of the Committee Staff Procurement Backup Book (P-Forms), as well as Research, Development, Test and Evaluation Descriptive Summaries (RDTE, or R-Forms). Using P&R Forms, budgetary forms and data can be quickly and efficiently submitted, coordinated, and approved.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Continued development of the Army's Budget System	0.112	0.110	0.112	-	0.112
FY 2018 Plans: Continued development of the Army's Budget System					
FY 2019 Base Plans: System enhancements to improve reliability of form data and efficiency of form creation.					
FY 2018 to FY 2019 Increase/Decrease Statement: Economic adjustment.					
Accomplishments/Planned Programs Subtotals	0.112	0.110	0.112	-	0.112

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

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) FE9 / <i>ALTESS (P&R Forms)</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
P&R System	SS/ Various	ALTESS : Radford, Virginia	-	0.112	Dec 2016	0.110		0.112		-		0.112	0.000	0.334	-
Subtotal			-	0.112		0.110		0.112		-		0.112	0.000	0.334	N/A
Project Cost Totals			-	0.112		0.110		0.112		-		0.112	0.000	0.334	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) FE9 / <i>ALTESS (P&R Forms)</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Application Support and assist users for FY18 Presidential Budget	■																											
Application Support and assist users for FY19 BES					■																							
P&R Forms v7.1 Release	▲1																											
P&R Forms v7.2 Release					▲2																							
P&R Forms v7.3 Release									▲3																			
P&R Forms v7.4 Release													▲4															
P&R Forms v7.45Release																	▲5											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) FE9 / <i>ALTESS (P&R Forms)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Application Support and assist users for FY18 Presidential Budget	2	2017	3	2017
Application Support and assist users for FY19 BES	4	2017	1	2018
P&R Forms v7.1 Release	2	2017	2	2017
P&R Forms v7.2 Release	4	2017	4	2017
P&R Forms v7.3 Release	2	2018	2	2018
P&R Forms v7.4 Release	4	2018	4	2018
P&R Forms v7.45Release	4	2019	4	2019

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>				Project (Number/Name) T04 / <i>USMEPCOM TRANSFORMTION - IT MODERNIZATION</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
T04: <i>USMEPCOM TRANSFORMTION - IT MODERNIZATION</i>	-	28.043	11.217	21.598	-	21.598	15.235	8.214	8.292	0.000	0.000	92.599
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

US Military Entrance Processing Command Integrated Resource System (MIRS) provides automation and communications capability to meet peacetime, mobilization and wartime military manpower accession mission for the Armed Services. MIRS interfaces with recruiting capabilities for the services, incorporating the concept of electronic data sharing using standard DoD data elements between USMEPCOM and all Armed Services recruiting commands. This project includes Computerized Adaptive Testing-Armed Services Vocational Aptitude Battery (CAT-ASVAB), automated Armed Services Vocational Aptitude Battery is given to determine applicants' mental abilities. Data Services mission consists of automatic data processing in support of USMEPCOM, the Selective Service System (SSS) and other external agencies for both peacetime and mobilization requirements. MIRS directly supports mobilization in the event of a military draft, through electronic links with the SSS and its ability to process and ship. USMEPCOM/MIRS is the only DoD organization legally authorized to collect civilian, medical and testing data for purposes of processing into military services and is the only DoD joint support system used to enforce congressional, DoD and Armed Forces qualification criteria for enlistment. USMEPCOM has established interfaces with US Citizenship and Immigration Services to verify citizenship status for applicants of military service to screen out undesired or security threat and Federal Bureau of Investigation for background screening using digital fingerprints to eliminate people with criminal records from entering military service. USMEPCOM's IT sustainment effort will maintain MIRS and the associated network certification and accreditation until the end of system lifecycle. MIRS was scheduled to be replaced by the Virtual Interactive Processing System (VIPS). VIPS program cancellation has placed USMEPCOMs legacy IT infrastructure at high risk. The resultant system leaves a non-compliant and non-networkworthy accession system with processing gaps that need to be addressed for secure, compliant, sustainable, and reliable capabilities to meet DoD and Service requirements. USMEPCOM must continue toward security and data integrity regulatory/security compliance (PII and HIPAA) or lose Authority to Operate.

Customers/beneficiaries of this investment include the Accessions Community of Interest (ACOI) including components of the Army, Navy, Air Force, Marines, Coast Guard, USMEPCOM and OSD (P&R).

Stakeholders include: All Uniformed Services, Assistant Secretary of Defense (Health Affairs), Defense Transportation Management Office, USD P&R, USD Intel, Defense Manpower Data Center and Department of Veterans Affairs.

Requested funding mitigates inefficient system sustainability and scalability through an update of the applications underlying database, operating system and middleware software. The current legacy system requires time consuming and expensive efforts to make operational changes (even minor ones) to military accessions processing to meet DoD and individual Services requirements. MIRS operational processes exist in a system where business rules and workflow are hard coded throughout the system. Any changes require extensive review and analysis of the code to see what is impacted before a change can be made, then extensive testing afterwards to make sure it works correctly throughout the accession process. Currently there are over 600 Problem Reports (PR) and System Change Requests (SCRs) pending.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T04 / <i>USMEPCOM TRANSFORMTION - IT MODERNIZATION</i>
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The requested funding also provides for the development of the Defense Digital Service's (DDS) Minimally Viable Product (MIRS 1.1) and its integration with existing applicant processing applications and the incorporation of MHS GENESIS with USMEPCOM's applicant processing systems. Lastly, funding will be used to develop a full-scale replacement for MIRS/MIRS 1.1, if deemed necessary.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: Phase 3 Application update</p> <p>Description: Initiate update of MIRS and associated Applicant Processing applications to secure applicant data</p> <p>FY 2018 Plans: Continue update of MIRS and associated Applicant Processing applications to secure applicant data</p> <p>FY 2019 Base Plans: Continue update of MIRS and associated Applicant Processing applications to secure applicant data, and fielding of DDS MIRS 1.1.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY 2018 funding was reduced by \$20M. These funds were realigned to FY 2019, \$10M and FY 2020, \$10M allowing USMEPCOM to better position funding for any Defense Business System modernization efforts identified by Business Process Reengineering.</p>	19.977	9.717	21.598	-	21.598
<p>Title: Project Support</p> <p>Description: Funding will support Information Technology</p> <p>FY 2018 Plans: Continue Update of MIRS and associated Applicant Processing Applications to facilitate DoDAF 2.0 and BEA compliant architecture.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Project in sustainment.</p>	8.066	1.500	-	-	-
Accomplishments/Planned Programs Subtotals	28.043	11.217	21.598	-	21.598

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

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T04 / <i>USMEPCOM TRANSFORMTION - IT MODERNIZATION</i>

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T04 / <i>USMEPCOM TRANSFORMTION - IT MODERNIZATION</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 PM Support	Various	TBD : TBD	9.645	-		8.474		21.598		-		21.598	0.000	39.717	-
Subtotal			9.645	-		8.474		21.598		-		21.598	0.000	39.717	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
MIRS Phase 3 & eSecurity/Biometircs Replacement	C/Various	various : various	12.062	28.043		2.743		-		-		-	Continuing	Continuing	-
Subtotal			12.062	28.043		2.743		-		-		-	Continuing	Continuing	N/A

Remarks
MEPCOM Jnt Comp Ctr(JCC) & Integ Resource Sys(IRR). This RDT&E will be used by USMEPCOM for continued project transformation support of VIPs.

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	21.707	28.043	11.217	21.598	-	21.598	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5		R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>		Project (Number/Name) T04 / <i>USMEPCOM TRANSFORMTION - IT MODERNIZATION</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
PRODUCT DEVELOPMENT																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T04 / <i>USMEPCOM TRANSFORMTION - IT MODERNIZATION</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
PRODUCT DEVELOPMENT	1	2015	4	2020

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>				Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
T05: <i>Army Business System Modernization Initiatives</i>	-	29.666	39.216	37.714	-	37.714	35.419	30.376	32.824	26.963	0.000	232.178
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Chief of Staff, Army Leaders' Dashboard was requested in an FY 2017 Above Threshold Reprogramming action.

A. Mission Description and Budget Item Justification

Global Force Information Management (GFIM): GFIM will provide the Army an enterprise, integrated authoritative force management capability for lifecycle management of force/organizational structure data for the entire Army. In addition, it will establish a common data standard for force structure data by implementing the Global Force Management - Data Initiative (GFM-DI).

The Army Training Information System (ATIS) will provide a common operational picture (COP) of the training environment through integrated, interoperable training development, management, scheduling, and delivery capabilities. Existing training information systems do not provide Commanders, leaders, Soldiers, and civilians a centralized COP of the training environment that enables persistent, consistent access to the Training and Education information and products necessary to support readiness to meet emerging threats. Without ATIS, Army organizations will continue to develop and maintain a multitude of training information systems that are not part of an enterprise, thus inhibiting visualization, understanding, and informed decision making.

CRRD began with the identification of capability gaps arising out of the 2010 Red Book and 2012 Gold Book, two extensive studies directed by senior army leadership to examine suicide prevention (Red Book) and the Army's health and discipline (Gold Book). The studies illustrated that Commanders faced capability gaps in their ability to identify high risk behavior and risk factors, analyze soldier and unit risk, and identify risk trends and develop intervention strategies. CRRD is capable of tracking high risk behavior patterns within a Commander's unit, coupled with a complete picture of high risk behavior of individuals will allow Commanders to take a more proactive mitigation approach through unit level training as well as individual interventions. The implementation of the CRRD will decrease the number of resources and steps involved in gathering data and providing Commanders with risk related information.

The Army Safety and Health Management System (ASHMS) initiative provides a framework of people, processes and technology to synchronize, integrate and optimize Army Safety and Occupational Health (SOH) capabilities to preserve war fighting capabilities and enhance the force by providing a safe and healthy environment for Soldiers, Families, Civilians, and contractors. An analysis of Army SOH Doctrine, Organization, Training, Materiel, Leadership and education, Personnel, Facilities and Policies (DOTMLPF-P) determined that the Army Safety Management Information System - Revised (ASMIS-R), a Defense Business System, is currently not able to satisfy current and emerging ASHMS capability requirements without modernization to resolve these capability gaps. Changes in requirements for the Army Safety and Health Management System (Programmatic) related to DoDI 6055.01, AR 385-10, Information Assurance requirements and direct feedback from the Safety professionals within the DoD and the Army have resulted in the need for changes in associated business processes. Additionally, a business gap analysis performed by the DASA(ESOH) revealed a deficiency in the system's requirements that would support Army Commands in identifying hazards in the work place, determining hazard

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>
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mitigation strategies and controls, employing these strategies and controls, and measuring their potential for reducing mishaps. Addressing these problems will have an immediate and direct impact on meeting regulatory requirements, improving data integrity, improving information assurance posture (compliance), increasing the Army's ability to reduce mishaps across the force structure, and promoting Army Force Generation (ARFORGEN) capabilities.

The Army Human Resources Command (HRC) has several efforts for which RDT&E will be applied. One is to prepare those systems for subsumption into the Integrated Personnel and Pay System (IPPS-A). The other is to disconnect and upgrade those systems not being subsumed by IPPS-A. Systems that will be targeted by HRC to prepare for IPPS-A subsumption or upgrade are the Automated Orders and resources System (AORS), Army Selection Board System (ASBS), Data Base Administration Suite of System (DBA), Enlisted Distribution and Assignment system (EDAS), Enlisted Promotion Model (EPM), Enterprise Service Bus (ESB), Human Resource Command Identity Management System (HIMS), Integrated Total Army Personnel Database (ITAPDB), Officer Selection Support System (OSSS), Reserve Statistics Accounting System/Reserve Component Common Personnel Data System (RSAS/RCCPDS), Senior Enlisted Promotions Model (SEPM), Single Evaluation Processing System (SEPS), Soldier Management System Webified Suite of System (SMSWEB), Total Army Personnel Data Base - Active Enlisted (TAPDB-AE), Total Army Personnel Data Base - Active Officer (TAPDB-AO), Total Army Personnel Data Base - Active Reserve (TAPDB-AR), Total Officer Personnel Management Information System (TOPMIS), Total Officer Personnel Management Information System II (TOPMIS II), Keystone Request/Retain System, and the Interactive Personnel Electronic Records Management System (iPERMS).

The Defense Language Software Upgrade will perform a major modification to the Universal Course Authoring Tool (UCAT). The modification will enable the tool to allow the curriculum development department to author new curricula without having to know a programming language, such as HTML. Currently, the tool has limited authoring templates and doesn't support the higher language levels or contain testing templates. The tool will do the programming automatically in the proper format for online viewing regardless of the mobile device used to view the material. This will enable the author to input the content in a predetermined way and the program will convert it into the proper online format. There will also be programming support to develop and convert existing online material into the current formats for use with all mobile devices regardless of the operating system used. Our current online material does not support all mobile devices and it needs to be reprogrammed to support all current mobile devices regardless of the Operating System (OS) used (Android, Apple, Microsoft). The Defense Language Institute (DLI) doesn't have the capability to do any programming modifications to existing programs. The programs are in need of modifications to meet DLI's new graduation standards of 2+/2+.

The Program Planning Budget (PPB)- Business Operating System (BOS) will standardize and better integrate the transactional automated information systems used in the HQDA level programming and budgeting processes. These systems are core to the PPBE business processes of the HQ for gathering programmatic requirements, balancing resources and delivering the Army's program budget to OSD. This project is streamlining programming and budgeting processes and significantly improving strategic analysis capabilities. The project is architecting, reengineering, streamlining and consolidating HQDA systems, feeder data base systems, and streamlining the associated processes. These improvements will improve capability, eliminate redundancies and reduce overall cost of operations. The PPB BOS project is complementary to the Army's General Fund Enterprise Business System (GFEBs) program. It includes a new effort in FY 2014, the Army Contract Writing System, a replacement for the DoD Standard Procurement System (SPS).

Army Career Tracker (ACT) is a leader development tool created to change significantly the way training, education, and experiential learning support is provided to Army enlisted, officers, civilians, and their leaders/supervisors. Users can search multiple education and training resources, monitor career development, and receive advice from their leadership. ACT provides single-site, easy access, and offers a complete and personalized career picture not available until now. ACT allows users

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>
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to manage career objectives and monitor progress towards career requirements and goals. ACT provides an integrated approach to supporting military and civilian personnel's personal and professional development which capitalizes on the mutual (personnel and Army) need for life-long learning. The unique inter-relationship between the user's personal growth and development, and the Army's need for Soldiers to be continuously developing, building and cultivating a culture of life-long learning is critical for the Soldier's and the Army's success. ACT comprises over 780,000 users with an adoption rate of 4,000 users per week. HQDA EXORD 054-12 ISO Army Transition mandates that leaders utilize roles in ACT to promote life-long learning and development opportunities throughout the Soldier's lifecycle of service (hire to retire).

The Defense Language Software Upgrade will perform a major modification to the Universal Course Authoring Tool (UCAT). The modification will enable the tool to allow the curriculum development department to author new curricula without having to know a programming language, such as HTML. Currently, the tool has limited authoring templates and doesn't support the higher language levels or contain testing templates. The tool will do the programming automatically in the proper format for online viewing regardless of the mobile device used to view the material. This will enable the author to input the content in a predetermined way and the program will convert it into the proper online format. There will also be programming support to develop and convert existing online material into the current formats for use with all mobile devices regardless of the operating system used. Our current online material does not support all mobile devices and it needs to be reprogrammed to support all current mobile devices regardless of the Operating System (OS) used (Android, Apple, Microsoft). The Defense Language Institute (DLI) doesn't have the capability to do any programming modifications to existing programs. The programs are in need of modifications to meet DLI's new graduation standards of 2+/2+.

Criminal Information Management System (CIMS): CIMS, formerly known as the Law Enforcement Advisory Program (LEAP), is a collection of mission essential information technology (IT) systems within the United States Army Criminal Investigation Command (USACIDC) and the Office of the Provost Marshal General (OPMG). Through CIMS, the USACIDC and the OPMG developed an integrated and unified, comprehensive enterprise program / system that houses both classified and unclassified Law Enforcement Sensitive (LES) data. CIMS leverages existing and future Army Law Enforcement (LE) enterprise information technology (IT) assets and other external data sources providing a full range of law enforcement functions to support business objectives and mission. The primary component is a comprehensive enterprise system known as the Army Law Enforcement Reporting and Tracking System (ALERTS) providing Army LE stakeholders the enhanced capability to rapidly and efficiently manage a variety of LE and criminal intelligence functions as well as a broader range of senior executive reporting requirements. The Consolidated Operations Police Suite (COPS) was previously comprised of five separate applications: two of these applications have been rationalized under ALERTS; the remaining three (related to the Army Corrections discipline) require modernization to ensure continued function and security compliance. RDT&E dollars are required to further enhance & enable CIMS' consolidation/rationalization of LE applications thereby providing the LE community the tools to more quickly investigate, solve, and prevent Army crime while also facilitating the management of those placed in corrections facilities. At present, all requested CID RDT&E funding will be applied to CIMS initiatives.

Educational Outreach Initiative: The Defense Forensic Science Center (DFSC), a subordinate element of USACIDC, requires funding for educational outreach initiatives including internship positions at the undergraduate, graduate, and doctoral candidate levels. The DFSC was designated as the leader for forensic science disciplines (DAPM Memo 4 Oct 2011). This memorandum states that the DFSC will establish a forensic RDT&E program that provides the integration of joint operational research, including procedures for establishing customer requirements, and identifying gaps and needs that lead to RDT&E priorities. The program includes developing a scholarly environment across the Defense Forensic Enterprise through the use of educational partnerships, internships and fellowships to facilitate participation in RDT&E projects. The Educational Outreach program provides an opportunity for students to contribute to forensic science research and influence shared research priorities

UNCLASSIFIED

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>
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across forensic science communities, while simultaneously supporting DFSC laboratory operations. Through the internship program, innovative research is conducted that supports research capabilities across the entire range of defense forensic operations (traditional laboratory, expeditionary (forward-deployed) laboratories, and reach-back functions).

Research & Development Identified through the Broad Agency Announcement (BAA) Initiative: The DFSC requires funds to coordinate the execution of forensic research projects that will enhance the capability of forensic science applications for DoD customers both in traditional law enforcement/criminal justice settings as well as in expeditionary environments. The DFSC staff manage federally-funded research & development contracts identified through a two-year, rolling BAA procedure. The BAA is issued under the provisions of paragraph 6.102(d) (2) of the Federal Acquisition Regulation (FAR), which provides for the competitive selection of proposals. Submitted BAA research proposals selected for award are considered to be the result of full and open competition and in full compliance with the provisions of Public Law 98-369, "The Competition in Contracting Act of 1984" (and subsequent applicable amendments).

Financial Integrated Reporting Environment (FIRE): FIRE is a U.S. Army Material Command (AMC) Enterprise Resource Planning (ERP) system currently deployed at the Armament, Research, Development and Engineering Center (ARDEC). FIRE supports the funding and manpower required to accomplish ARDEC's reimbursable workload. RDTE is required to develop and expand the system as an enterprise solution across all AMC reimbursable activities. This strategy is in line with existing Army Portfolio Management System (APMS) and Business Enterprise Architecture (BEA) Objectives.

Regional Level Application Software (RLAS) is a critical IT application to the AR managing the automated military pay, funds control, training calendar management and administrative records management for 198,000 Soldiers.

Army Software Marketplace (ASM): ASM will enable the Army to have a centralized location to store software applications and application metadata.

Chief of Staff, Army (CSA) Leaders' Dashboard: The CSA Leaders' Dashboard will capture and store readiness information in order to produce predictive analytics and facilitate decision making by senior Army leaders.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: Global Force Information Management</p> <p>Description: Global Force Information Management (GFIM): GFIM will provide the Army an enterprise, integrated authoritative force management capability for lifecycle management of force/organizational structure data for the entire Army. In addition, it will establish a common standard for force structure data by implementing the Global Force Management Data Initiative (GFM-DI).</p> <p>FY 2018 Plans:</p>	-	2.968	2.887	-	2.887

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Funding will be used for pre-Milestone Acquisition Planning including development of acquisition strategy, cost estimating, and contract strategy. In addition, funding will be used to support pre-Milestone Systems Engineering support for requirements analysis and functional blueprinting support.</p> <p>FY 2019 Base Plans: Funding will be used for continuation of Acquisition Planning and Systems Engineering support for GFIM requirements analysis and initial system design, along with prototyping efforts.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY 2018 included start up costs.</p>					
<p>Title: Army Training Information System (ATIS)</p> <p>Description: Army Training Information System (ATIS) is an enterprise system that will provide a common operational picture (COP) of the training environment through integrated, interoperable training development, management, scheduling, and delivery capabilities. These capabilities will enable Commanders, leaders, Soldiers, and civilians to better understand, visualize, describe, direct, lead, and assess training requirements so they can more effectively plan, prepare, execute, and assess training. End result is an ATIS that enables Soldiers to train as they will fight, so they can effectively fight as they have trained.</p> <p>FY 2018 Plans: Funding will be used to continue the Business System Functional Requirements and Acquisition Planning (BS FARP) phase activities, complete RFP activities, and develop documentation needed to achieve the Acquisition Authority to Proceed (ATP) milestone.</p> <p>FY 2019 Base Plans: Funding will be used to complete the Business System Functional Requirements and Acquisition Planning (BS FARP) phase activities, develop documentation needed to achieve the Acquisition Authority to Proceed (ATP) milestone, develop Business System Acquisition, Testing and Deployment (BS ATD) RFP, and enter into BS ATD phase to begin development of the Army Training Information System (ATIS).</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding will be used to execute the Business System Acquisition and begin the development of the Army Training Information System (ATIS).</p>	15.663	12.722	15.859	-	15.859
<p>Title: Commanders Risk Reduction Dashboard (CRRD)</p>	0.627	1.485	3.068	-	3.068

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: CRRD will consolidate information from multiple Army databases and present to commanders a concise report about which Soldiers in their unit have been involved with at-risk behaviors, some of which may be associated with suicide, and when those instances occurred.</p> <p>FY 2018 Plans: -Complete development of CRRD Inc 2 capability -Conduct Operational Test</p> <p>FY 2019 Base Plans: The CRRD tool will provide a single dashboard of information that identified potential attributes that increase the risk of suicide. The dashboard will provide Commanders in all Army components with the capability to obtain information regarding the soldier?s previous disciplinary actions, both civilian and UCMJ as well as the information regarding the health of the Soldier. This information will enable the Commander to gain additional inputs on the Soldier?s background, allowing the Commander to adjust their leadership and counseling approach to improve the Soldier?s wellbeing therefore increasing their ability to perform their duties.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: In addition to the 099 AHRS project line, CRRD has a confirmed development requirement in FY 2018 for \$1.485M. In FY 2019, the programs requires at least \$800K of the projected \$3.068M to complete development and design of various system interfaces.</p>					
<p>Title: The Army Safety and Health Management System (ASHMS)</p> <p>Description: The Army Safety and Health Management System (ASHMS) initiative provides a framework of people, processes and technology to synchronize, integrate and optimize Army Safety and Occupational Health (SOH) capabilities to preserve war fighting capabilities and enhance the force by providing a safe and healthy environment for Soldiers, Families, Civilians, and contractors. An analysis of Army SOH Doctrine, Organization, Training, Materiel, Leadership and education, Personnel, Facilities and Policies (DOTMLPF-P) determined that the Army Safety Management Information System ? Revised (ASMIS-R), a Defense Business System, is currently not able to satisfy current and emerging ASHMS capability requirements without modernization to resolve these capability gaps. Changes in requirements for the Army Safety and Health Management System (Programmatic) related to DoDI 6055.01, AR 385-10, Information Assurance requirements and direct feedback from the Safety professionals within the DoD and the Army have resulted in the need for changes in associated business processes. Additionally, a business gap analysis performed by the DASA(ESOH) revealed a deficiency in the system's requirements that would support Army Commands in identifying hazards in the</p>	5.533	0.191	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
work place, determining hazard mitigation strategies and controls, employing these strategies and controls, and measuring their potential for reducing mishaps. Addressing these problems will have an immediate and direct impact on meeting regulatory requirements, improving data integrity, improving information assurance posture (compliance), increasing the Army's ability to reduce mishaps across the force structure, and promoting Army Force Generation (ARFORGEN) capabilities. .					
FY 2018 Plans: FY 2018 funds are being used to continue development of products and tools to modernize mishap reporting through the addition of an Initial Notification capability for Commanders, offline capability for mishap reporting in low/no bandwidth areas, and mobile application capabilities as well as Human Factors risk management.					
FY 2018 to FY 2019 Increase/Decrease Statement: System in sustainment.					
Title: Army Business System Modernization Initiatives, CPOL, iPERMS & RLAS	0.682	1.379	1.200	-	1.200
Description: Modernization requirements will add new capabilities to legacy IT systems that support human resource functions such as organization and position management, training, and employment. The PPB BOS system standardize and integrate the transactional information systems used in the Headquarters Department of Army (HQDA) Programming and Budgeting processes. The program is streamlining programming and budgeting business processes and significantly improving strategic analysis capabilities. The PPB BOS architecture reengineers, streamlines, and consolidates HQDA systems and financial feeder systems; aligns to the DoD Business Enterprise Architecture (BEA); implements powerful business intelligence analytical tools to support strategic planning, programming, and budgeting within HQDA; and provides access to GFEBS funds management and execution data through system interfaces with required SFIS compliancy integral to the PPB BOS data model. The LEAP program will provide criminal intelligence querying and reporting capabilities in compliance with regulatory and policy standards for Army Law Enforcement regarding investigation of felony crimes. LEAP captures criminal case investigative information regarding incidents, location descriptors, entities (name, social security number, rank, title, physical characteristics, sex, birth place, and date), agent assignment, crime description and identifiers, statements, property data, laboratory tests; verifies and stores this data for criminal intelligence purposes: and reports this information to the proper authorities from the Division Commanding Officer to the United States Grand Jury. The system will extract necessary data for consolidation and input to Defense Incident-Based Reporting System (DIBRS) monthly reports, National Incident-Based Reporting System (NIBRS) monthly reports and the Defense Clearance and Investigations Index (DCII) daily updates. The LIMS system will automate business processes that support the forensic examiners. These					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
processes include, but are not limited to, analytics, materials management, management reporting, Freedom of Information Act requests (FOIA), legal discovery request, court preparation and outsource processing.					
Civilian Personnel Online - Portal (CPOL-Portal) is a one stop secure site which provides Army civilian employees and HR specialists access to a private portal with a complete set of employment related resources, links and web based applications that require single sign-on access - Army Regional Tools (ART). CPOL-Portal will provide an Integrated Management System (IMS) in support of Civilian Workforce Transformation (CWT). It will support Civilian human capital decision making and allow leaders and employees to perform their roles more efficiently in support of Army goals and missions. CPOL Portal will provide the full spectrum of IT application support and access to Acquire, Develop, Distribute and Sustain components of the Army Civilian HCM Life-Cycle and link to G3 'Structure' IT Enterprise Applications.					
The Fully Automated System for Classification (FASCLASS) is a centralized, web-based system that maintains civilian position descriptions and position related information across Department of the Army. It provides classifiers and managers capability to create, edit, and verify position descriptions. Also it offers robust search, report generation, and lookup & support capabilities.					
The Overseas Entitlement Tracker (OET) provides the capability to accurately track Living Quarters Allowance (LQA). LQA is provided to reimburse employees for suitable, adequate living quarters at posts where the U.S. Government does not provide quarters. OET also tracks these other overseas entitlements for employees: Advance Pay, Danger Pay, Imminent Danger Pay, Foreign Differential, Home Leave, Post Allowance, Separation Maintenance Allowance, and Temporary Quarters Subsistence Allowance.					
FY 2018 Plans: Continue to fund Army Business System Modernization Initiatives.					
FY 2019 Base Plans: Continue to fund Army Business System Modernization Initiatives					
FY 2018 to FY 2019 Increase/Decrease Statement: Economic adjustments.					
Title: Army Career Tracker (ACT)	0.748	0.960	0.962	-	0.962

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: Modify the existing Soldier Home Page to quickly display key career related status requiring immediate action. Use ACT professional development systems to support and enhance Soldier competitive efforts for advancement and retention. ACT will utilize the Real-Time Broker Service (RBS) to get the DoD ID Number from DMDC for new users who come to them through these other systems. This method will allow ACT to retrieve DoD ID for users that may not have been processed in the Batch Request.</p> <p>FY 2018 Plans: The revision of the Professional development model will ensure greater granularity, while providing the ability to capture and report on branch competencies by skill levels. This effort will include provide a backend administrative console for use of management and sustainment, additions and deletions of career/learning content and related competencies. The automated Individual Development Plan in ACT does not support the continuous interaction between the supervisor and employee as a living document. As we transition to DoD Performance Management and Appraisal Program (DPMAP), these required enhancements to the ACT system will assist in keeping a strong connection between performance management and employee development. Currently the Sergeant Major Management Office (SMMO) does not have an enterprise level leader development tool for accurate display management of KSAs at the personnel or position level. Exportable Life Long Learning Profile is needed in collaboration with each individual, identify employment, education, and training opportunities which will extend their talents and optimize their performance.</p> <p>FY 2019 Base Plans: The revision of the Professional development model will ensure greater granularity, while providing the ability to capture and report on branch competencies by skill levels. This effort will include provide a backend administrative console for use of management and sustainment, additions and deletions of career/learning content and related competencies. The automated Individual Development Plan in ACT does not support the continuous interaction between the supervisor and employee as a living document. As we transition to DoD Performance Management and Appraisal Program (DPMAP), these required enhancements to the ACT system will assist in keeping a strong connection between performance management and employee development. Currently the Sergeant Major Management Office (SMMO) does not have an enterprise level leader development tool for accurate display management of KSAs at the personnel or position level. Exportable Life Long Learning Profile is needed in collaboration with each individual, identify employment, education, and training opportunities which will extend their talents and optimize their performance.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p>					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Economic adjustments.					
<p>Title: Criminal Information Management System (CIMS)</p> <p>Description: CIMS formerly known as the Law Enforcement Advisory Program (LEAP), is a collection of mission essential information technology (IT) systems within the Criminal Investigation Command (CIDC) and the Office of the Provost Marshal General (OPMG). Thru the CIMS, USACIDC and OPMG developed an integrated and unified, comprehensive enterprise program / system that houses Classified and Unclassified - Law Enforcement Sensitive (LES) data, leveraging existing and future Army LE enterprise information technology (IT) assets and other external data sources providing a full range of law enforcement functions to support business objectives and mission. The primary component is a comprehensive enterprise system, known as the Army Law Enforcement Reporting and Tracking System (ALERTS), provides US Army Law Enforcement stakeholders the enhanced capability to rapidly and efficiently manage a variety of Law Enforcement and criminal intelligence (CrimIntel) functions; as well as a broader range of senior executive reporting requirements. RDT&E dollars are required to further enhance ALERTS and other CIMS systems to continue the consolidation/rationalization of LE applications, and to give the LE community the tools to more quickly investigate, solve, and prevent Army crime.</p> <p>FY 2018 Plans: FY 2018 funds will continue to develop the Database and to increase and improve law enforcement data sharing in the Army Law Enforcement Community. FY 2018 RDT&E dollars are required to further enhance ALERTS, COPS and other CIMS systems to continue the consolidation/rationalization of Law Enforcement applications, and to give the law enforcement community the tools to more quickly investigate, solve, and prevent Army crime.</p> <p>FY 2019 Base Plans: FY 2019 funds will continue to develop the Database and to increase and improve law enforcement data sharing in the Army Law Enforcement Community. FY 2019 RDT&E dollars are required to further enhance ALERTS, COPS and other CIMS systems to continue the consolidation/rationalization of Law Enforcement applications, and to give the law enforcement community the tools to more quickly investigate, solve, and prevent Army crime.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Economic adjustments.</p>	2.167	4.361	4.094	-	4.094
<p>Title: Educational Outreach Initiative</p> <p>Description: Defense Forensic Science Center requires funding for educational outreach initiatives including internship positions at the undergraduate, graduate, and doctoral candidate levels. Defense Forensic Science</p>	0.156	-	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Center was designated as the leader for forensic science disciplines (DAPM Memo 4 Oct 2011). This memorandum states that the DFSC will establish a forensic RDT&E program that provides the integration of joint operational research, including procedures for establishing customer requirements, and identifying gaps and needs that lead to RDT&E priorities. The program includes developing a scholarly environment across the Defense Forensic Enterprise through the use of educational partnerships, internships and fellowships to facilitate participation in RDT&E projects. The Educational Outreach program will provide an opportunity for students to contribute to forensic science research and influence shared research priorities across the forensic science communities, while supporting the DFSC and laboratory operations. Through the internship program, a variety of innovative research will be conducted that supports research capabilities across the entire range of military operations including traditional, expeditionary (forward deployed laboratories), and reach-back operations.					
<p>Title: Financial Integrated Reporting Environment (FIRE)</p> <p>Description: FIRE supports the funding and manpower required to accomplish ARDEC's reimbursable workload. RDTE is required to develop and expand the system as an enterprise solution across all AMC reimbursable activities. This strategy is in line with existing Army Portfolio Management System (APMS) and Business Enterprise Architecture (BEA) Objectives.</p> <p>FY 2018 Plans: Continue funding development work to expand the system as an enterprise solution across all AMC reimbursable activities.</p> <p>FY 2019 Base Plans: Continue funding development work to expand the system as an enterprise solution across all AMC reimbursable activities.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Economic adjustments.</p>	0.104	8.291	8.228	-	8.228
<p>Title: Research & Development Identified through the Broad Agency Announcement Initiative</p> <p>Description: The Defense Forensic Science Center (DFSC) requires funds to coordinate the execution of forensic research projects that will enhance the capability of forensic science applications for DoD customers both in traditional law enforcement/criminal justice purviews and in expeditionary environments. The DFSC staff will manage federally funded research and development contracts identified through a two year rolling Broad Agency Announcement (BAA) procedure. The BAA is issued under the provisions of paragraph 6.102(d)</p>	2.340	-	-	-	-

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
(2) of the Federal Acquisition Regulation (FAR), which provides for the competitive selection of proposals. Research proposals submitted in response to this BAA and selected for award are considered to be the result of full and open competition and in full compliance with the provisions of Public Law 98-369, "The Competition in Contracting Act of 1984" and subsequent amendments.					
<p>Title: Defense Language Software Upgrade</p> <p>Description: Modify the Universal Course Authoring Tool (UCAT). This tool will enable the curriculum development department to author new curricula without having to program in HTML. The tool will do the programming automatically in the proper format for online viewing. There will also be programming support to develop and convert existing online material into the current formats for use with all mobile devices regardless of the operating system used.</p> <p>FY 2018 Plans: Modify the Universal Course Authoring Tool (UCAT). This tool will enable the curriculum development department to author new curricula without having to program in HTML. The tool will do the programming automatically in the proper format for online viewing. There will also be programming support to develop and convert existing online material into the current formats for use with all mobile devices regardless of the operating system used.</p> <p>FY 2019 Base Plans: Modify the Universal Course Authoring Tool (UCAT). This tool will enable the curriculum development department to author new curricula without having to program in HTML. The tool will do the programming automatically in the proper format for online viewing. There will also be programming support to develop and convert existing online material into the current formats for use with all mobile devices regardless of the operating system used.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Inflation adjustment to funding.</p>	1.646	1.379	1.416	-	1.416
<p>Title: Army Software Marketplace (ASM)</p> <p>Description: ASM will enable the Army to have a centralized location to store software applications and application metadata.</p> <p>FY 2018 Plans:</p>	-	5.480	-	-	-

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
User will be able to access application software to perform their mission. ASM will allow the Army to avoid duplicative efforts and excessive cost by creating a standardized environment. ASM will allow the Army to manage software applications and control which users have the ability to download and/or install software. <i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> There is no requirement for development in FY 2019 for Army Software Marketplace.					
Accomplishments/Planned Programs Subtotals	29.666	39.216	37.714	-	37.714

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

N/A

Remarks

D. Acquisition Strategy

Modernize IT legacy systems across Army IT domains by adapting/improving government off the shelf (GOTS), commercial off the shelf (COTS), and new software development to perform various tasks in a networked environment. These efforts include Army Contract Writing System (ACWS), Army Training Information System (ATIS), Soldier Management System (SMS), Commander's Risk Reduction Dashboard (CRRD), the Army Strategic Readiness Update (ASRU), Law Enforcement Advisory Program (LEAP), Educational Outreach Program, R&D Broad Agency Program, Program Planning Budget Execution (PPBE) - Business Operating System (BOS), Automated Orders and Resources System (AORS), Army Selection Board System (ASBS), Data Base Administration Suite of System (DBA), Enlisted Distribution and Assignment system (EDAS), Enlisted Promotion Model (EPM), Enterprise Service Bus (ESB), Human Resource Command Identity Management System (HIMS), Integrated Total Army Personnel Database (ITAPDB), Officer Selection Support System (OSSS), Reserve Statistics Accounting System/Reserve Component Common Personnel Data System (RSAS/RCCPDS), Senior Enlisted Promotions Model (SEPM), Single Evaluation Processing System (SEPS), Soldier Management System Webified Suite of System (SMSWEB), Total Army Personnel Data Base - Active Enlisted (TAPDB-AE), Total Army Personnel Data Base - Active Officer (TAPDB-AO), Total Army Personnel Data Base -Active Reserve (TAPDB-AR), Total Officer Personnel Management Information System (TOPMIS), Total Officer Personnel Management Information System II (TOPMIS II), KEYSTONE Retain System, Army Contract Writing System (ACWS), Army Mapper, and the Interactive Personnel Electronic Records Management System (iPERMS).

ACWS strategy is to perform all requisite activities to concurrently develop pre-milestone A/B documentation and perform pre-solicitation/source selection activities to meet the USD AT&L timelines for building a contract writing system to replace legacy contract systems to include the Standard Procurement System (SPS).

ASMIS-R is comprised of legacy modules (applications) that require modernization to maintain their relevancy to the Army in support of mishap reduction. As stated above, these are primarily related to meeting minimum DoD regulatory requirements related to the collection of mishap information, safety information storage, and resolving inefficiencies in data quality control and information flow.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>
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Additionally, advances in technology allow for improvements in performance and data integrity that currently are deficiencies in the system. ASMIS-R, in its current state, does not provide any IT (material solution) to the business requirements identified above. The Command has utilized a FFP contract to execute specific Task Orders to develop the tools and products through mid-year FY 2015. The CRC will be competing a new contract vehicle to support the development of products and tools from midyear FY 2015 through FY 2019.

HQDA AG-1 Civilian Personnel (CP) Systems' Acquisition Strategy - The HQDA AG-1 Civilian Personnel (CP) office, Civilian Information Services Division (CISD) Chief and Program Managers will manage these modernization efforts and will utilize the HQDA AG-1 CP's Configuration Control Committee (CCC), Configuration Control Board (CCB), and Integrated Product Teams (IPT) to ensure the appropriate functionality is implemented into OET, CPOL Portal, and FASCLASS. Development tasks will be performed by AG-1 CP's contractor staff, whose performance is monitored according to the Quality Assurance Surveillance Program. In addition, unit testing and operational testing will be implemented to ensure the new functionality performs as required. This work will be performed on a firm- fixed- price contract vehicle.

GFIM will leverage an existing Force Management System Cost Plus Fixed Fee contract with CACI to execute development efforts.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605013A / Information Technology Development				T05 / Army Business System Modernization Initiatives							
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PRODUCT DEVELOPMENT FOR KEYSTONE RETAIN SYSTEM, i-PERMS PRODUCT DEVELOPMENT	MIPR	M&RA/G-1 : ARLINGTON, VA	16.570	-		-		-		-		-	0.000	16.570	-
PPBOS PRODUCT DEVELOPMENT	MIPR	OAA : FORT BELVOIR, VA	23.230	0.104		8.291		8.228		-		8.228	0.000	39.853	-
Product Development for ACWS	C/IDIQ	PEO EIS : Alexandria, VA	45.741	-		-		-		-		-	Continuing	Continuing	Continuing
ATIS	C/IDIQ	PEO EIS : FT Eustice VA	8.845	15.663		12.722		15.859		-		15.859	Continuing	Continuing	-
CRRD	C/IDIQ	TBD : TBD	-	0.627		1.485		3.068		-		3.068	Continuing	Continuing	-
The Army Safety and Health Management System	C/IDIQ	TBD : TBD	3.692	4.533		0.191		-		-		-	Continuing	Continuing	-
Army Career Tracker	C/FFP	IBM : Reston, VA	0.580	0.748		0.960		0.962		-		0.962	Continuing	Continuing	-
Army Business System Modernization Initiatives	C/IDIQ	TBD : TBD	19.715	1.682		1.379		1.200		-		1.200	Continuing	Continuing	-
CIMS	C/IDIQ	ACC : NCR	0.003	2.167		4.361		4.094		-		4.094	0.000	10.625	-
Educational Outreach Initiative:	C/IDIQ	DFSC : FT Gillem	-	0.156		-		-		-		-	0.000	0.156	-
Research & Development Identified through the Broad Agency Announcement Initiative	C/IDIQ	DFSC : Ft Gillem	-	2.340		-		-		-		-	0.000	2.340	-
Defense Language Software Upgrade	C/FFP	TBD : TBD	0.878	1.646		1.379		1.416		-		1.416	0.000	5.319	-
Army Software Marketplace (ASM)	TBD	PEO EIS : Fort Belvoir, VA	-	-		5.480		-		-		-	0.000	5.480	-
Global Force Information Management	Option/CPFF	CACI : Chantilly, VA	-	-		2.968		2.887		-		2.887	0.000	5.855	-
Subtotal			119.254	29.666		39.216		37.714		-		37.714	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			

Remarks

Global Force Information Management (GFIM): GFIM will provide the Army an enterprise, integrated authoritative force management capability for lifecycle management of force/organizational structure data for the entire Army. In addition, it will establish a common data standard for force structure data by implementing the Global Force Management - Data Initiative (GFIM-DI).

Army Training Information System (ATIS) is an enterprise system that will provide a common operational picture of the training environment through integrated, interoperable training development, management, scheduling, and delivery capabilities. These capabilities will enable commanders, leaders, soldiers, and civilians to better understand, visualize, describe, direct, lead and assess training requirements so they can more effectively plan, prepare, execute, and assess training. End result is an ATIS that enables soldiers to train as they fight so they can effectively fight as they have trained.

Adapt/improve/install/field government off the shelf (GOTS), commercial off the shelf (COTS), and new software to perform various tasks in a networked environment such as data warehousing, force management, personnel, installation and environmental databases and applications to support Business System Transformation and Installation Management, to include Commander's Risk Reduction Dashboard.

The Army Human Resources Command (HRC) has several efforts for which RDT&E will be applied. One is to prepare those systems for subsumption into the Integrated Personnel and Pay System (IPPS-A). The other is to disconnect and upgrade those systems not being subsumed by IPPS-A. Systems that will be targeted by HRC to prepare for IPPS-A subsumption or upgrade are the Automated Orders and resources System (AORS), Army Selection Board System (ASBS), Data Base Administration Suite of System (DBA), Enlisted Distribution and Assignment system (EDAS), Enlisted Promotion Model (EPM), Enterprise Service Bus (ESB), Human Resource Command Identity Management System (HIMS), Integrated Total Army Personnel Database (ITAPDB), Officer Selection Support System (OSSS), Reserve Statistics Accounting System/ Reserve Component Common Personnel Data System (RSAS/RCCPDS), Senior Enlisted Promotions Model (SEPM), Single Evaluation Processing System (SEPS), Soldier Management System Webified Suite of System (SMSWEB), Total Army Personnel Data Base - Active Enlisted (TAPDB-AE), Total Army Personnel Data Base - Active Officer (TAPDB-AO), Total Army Personnel Data Base - Active Reserve (TAPDB-AR), Total Officer Personnel Management Information System (TOPMIS), Total Officer Personnel Management Information System II (TOPMIS II), Keystone Request/Retain System, and the Interactive Personnel Electronic Records Management System (iPERMS).

Criminal Information Management System (CIMS): CIMS formerly known as the Law Enforcement Advisory Program (LEAP), is a collection of mission essential information technology (IT) systems within the Criminal Investigation Command (CIDC) and the Office of the Provost Marshal General (OPMG). Thru the CIMS, USACIDC and OPMG developed an integrated and unified, comprehensive enterprise program / system that houses Classified and Unclassified - Law Enforcement Sensitive (LES) data, leveraging existing and future Army LE enterprise information technology (IT) assets and other external data sources providing a full range of law enforcement functions to support business objectives and mission. The primary component is a comprehensive enterprise system, known as the Army Law Enforcement Reporting and Tracking System (ALERTS), provides US Army Law Enforcement stakeholders the enhanced capability to rapidly and efficiently manage a variety of Law Enforcement and criminal intelligence (CrimIntel) functions; as well as a broader range of senior executive reporting requirements. RDT&E dollars are required to further enhance ALERTS and other CIMS systems to continue the consolidation/rationalization of LE applications, and to give the LE community the tools to more quickly investigate, solve, and prevent Army crime.

Educational Outreach Initiative: The Defense Forensic Science Center (DFSC), a subordinate element of USACIDC, requires funding for educational outreach initiatives including internship positions at the undergraduate, graduate, and doctoral candidate levels. The DFSC was designated as the leader for forensic science disciplines (DAPM Memo 4 Oct 2011). This memorandum states that the DFSC will establish a forensic RDT&E program that provides the integration of joint operational research, including procedures for establishing customer requirements, and identifying gaps and needs that lead to RDT&E priorities.

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ACWS Product Development	[Redacted]				[Redacted]																							
ATIS Product Development	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
CRRD Product Development	[Redacted]				[Redacted]																							
ASHMS Product Development	[Redacted]				[Redacted]																							
ACT Product Development	[Redacted]				[Redacted]																							
Army Business System Modernization	[Redacted]				[Redacted]				[Redacted]				[Redacted]															
Army Software Marketplace (ASM)	[Redacted]				[Redacted]																							
Global Force Information Management	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) T05 / <i>Army Business System Modernization Initiatives</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
PPB BOS Product Development	1	2014	4	2015
ACWS Product Development	1	2014	4	2018
ATIS Product Development	1	2016	1	2023
CRRD Product Development	1	2016	2	2017
ASHMS Product Development	1	2016	2	2018
ACT Prduct Development	1	2016	4	2018
Army Business System Modernization	1	2016	4	2020
Army Software Marketplace (ASM)	3	2017	1	2018
Global Force Information Management	2	2018	4	2021

Note

Army Contract Writing System moves to 0605047 FY 2017.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) VR3 / <i>ASMIS-R (REPORTIT)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
VR3: <i>ASMIS-R (REPORTIT)</i>	-	0.000	3.598	3.026	-	3.026	3.095	3.159	3.222	3.268	0.000	19.368
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Army Safety and Health Management System (ASHMS) initiative provides a framework of people, processes and technology to synchronize, integrate and optimize Army Safety and Occupational Health (SOH) capabilities to reserve war fighting capabilities and enhance the force by providing a safe and healthy environment for Soldiers, Families, Civilians, and contractors. An analysis of Army SOH Doctrine, Organization, Training, Materiel, Leadership and education, Personnel, Facilities and Policies (DOTMLPF-P) determined that the Army Safety Management Information System - Revised (ASMIS-R), a Defense Business System, is currently not able to satisfy current and emerging ASHMS capability requirements without modernization to resolve these capability gaps. Changes in requirements for the Army Safety and Health Management System (Programmatic) related to DoDI 6055.01, AR 385-10, Information Assurance requirements and direct feedback from the Safety professionals within the DoD and the Army have resulted in the need for changes in associated business processes. Additionally, a business gap analysis performed by the DASA(ESOH) revealed a deficiency in the system's requirements that would support Army Commands in identifying hazards in the work place, determining hazard mitigation strategies and controls, employing these strategies and controls, and measuring their potential for reducing mishaps. Addressing these problems will have an immediate and direct impact on meeting regulatory requirements, improving data integrity, improving information assurance posture (compliance), increasing the Army's ability to reduce mishaps across the force structure, and promoting Army Force Generation (ARFORGEN) capabilities.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: ASMIS-R Development	-	3.598	3.026	-	3.026
FY 2018 Plans: FY 2018 funds are being used to continue development of ASMIS-R products and tools.					
FY 2019 Base Plans: FY 2019 funds are being used to continue development of ASMIS-R products and tools.					
FY 2018 to FY 2019 Increase/Decrease Statement: Contract rate adjustment beginning in FY 2019.					
Accomplishments/Planned Programs Subtotals	-	3.598	3.026	-	3.026

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

N/A

Remarks

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) VR3 / <i>ASMIS-R (REPORTIT)</i>

D. Acquisition Strategy

ASMIS-R is comprised of legacy modules (applications) that require modernization to maintain their relevancy to the Army in support of mishap reduction. As stated above, these are primarily related to meeting minimum DoD regulatory requirements related to the collection of mishap information, safety information storage, and resolving inefficiencies in data quality control and information flow.

Additionally, advances in technology allow for improvements in performance and data integrity that currently are deficiencies in the system. ASMIS-R, in its current state, does not provide any IT (material solution) to the business requirements identified above. The Command has utilized a FFP contract to execute specific Task Orders to develop the tools and products through mid-year FY 2015. The CRC will be competing a new contract vehicle to support the development of products and tools from midyear FY 2015 through FY 2019.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018				
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>					Project (Number/Name) VR3 / <i>ASMIS-R (REPORTIT)</i>						
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Product Development	Option/ FFP	Global Technology Services : Anchorage, Alaska	-	-		3.598		3.026		-		3.026	0.000	6.624	-	
Subtotal			-	-		3.598		3.026		-		3.026	0.000	6.624	N/A	
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals			-	-		3.598		3.026		-		3.026	0.000	6.624	N/A	

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) VR3 / <i>ASMIS-R (REPORTIT)</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Product Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / <i>Information Technology Development</i>	Project (Number/Name) VR3 / <i>ASMIS-R (REPORTIT)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Product Development	3	2018	3	2019

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605018A / <i>Integrated Personnel and Pay System-Army (IPPS-A)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	149.597	172.361	166.603	-	166.603	38.853	19.800	60.466	59.279	Continuing	Continuing
ED9: <i>Integrated Personnel and Pay System - Army Inc 2</i>	-	149.597	172.361	166.603	-	166.603	38.853	19.800	60.466	59.279	Continuing	Continuing

Note

IPPS-A Increment II (Project ED9) is a designated Acquisition Category IA Major Automated Information System (MAIS) program.

A. Mission Description and Budget Item Justification

The Integrated Personnel and Pay System-Army (IPPS-A) provides an integrated, multi-Component, personnel and pay system, which streamlines the existing Human Resources (HR) systems and processes enhancing efficiency and accuracy of personnel and pay procedures in support of 1.1 million Soldiers and their families. IPPS-A will subsume approximately 40 legacy systems across the Active, Reserve and National Guard into a single integrated system. IPPS-A will be a web-based tool, available 24-hours a day, accessible to HR professionals, combatant commanders, pay managers and other authorized users throughout the Army. IPPS-A addresses major deficiencies in the delivery of military personnel and pay services by providing the necessary internal control and audit procedures as well as preventing erroneous payments and loss of funds.

B. Program Change Summary (\$ in Millions)

	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	155.584	172.361	122.630	-	122.630
Current President's Budget	149.597	172.361	166.603	-	166.603
Total Adjustments	-5.987	0.000	43.973	-	43.973
• Congressional General Reductions	-0.076	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-5.911	-			
• Adjustments to Budget Years	-	-	43.973	-	43.973

Change Summary Explanation

Adjustments to FY 2019 RDTE support multiple concurrent development of Release 3.0 thru Release 5.0.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605018A / <i>Integrated Personnel and Pay System-Army (IPPS-A)</i>				Project (Number/Name) ED9 / <i>Integrated Personnel and Pay System - Army Inc 2</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ED9: <i>Integrated Personnel and Pay System - Army Inc 2</i>	-	149.597	172.361	166.603	-	166.603	38.853	19.800	60.466	59.279	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

IPPS-A Increment II is a designated Acquisition Category IA Major Automation Information System (MAIS) program.

A. Mission Description and Budget Item Justification

The Integrated Personnel and Pay System - Army (IPPS-A) Increment II will deliver fully integrated personnel and pay services for all Army Components building on the trusted database delivered by the IPPS-A Increment I program. Increment II will be able to link the personnel and pay functions for all Army personnel eliminating duplicate data entry, reducing complex system maintenance, and minimizing pay discrepancies. IPPS-A Increment II will account for duty status and service time changes between Active and Reserve/National Guard Components to ensure accurate credit for service and individual pay as well as enable disciplined human resource management processes.

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

	FY 2017	FY 2018	FY 2019
Title: Analysis and Design, Development, and Integration of IPPS-A Increment II	149.597	172.361	166.603
Description: Funding is provided for the following efforts:			
FY 2018 Plans: IPPS-A will complete Limited User Test (LUT), and Limited Fielding Decision Activity for the Army National Guard (Release 2.0). IPPS-A will continue the system design, configuration, development, integration, and major testing activities leading to the Government Acceptance Testing for Release 3.0. IPPS-A will complete the IPR, IBR, PDR for Release 4.0. IPPS-A will complete all critical activities to complete an IPR for Release 5.0.			
FY 2019 Plans: IPPS-A will complete all testing requirements leading to Limited Fielding Decision for Release 3.0. IPPS-A will complete all critical activities leading to an equivalent Milestone C Decision. IPPS-A will begin all critical activities to complete system design, configuration, development and integration for Release 5.0.			
FY 2018 to FY 2019 Increase/Decrease Statement: A total of \$5.8 million decrease from FY2018 to FY2019 is part of the Department's strategy to re-phase FY2019 requirements to the out years.			
Accomplishments/Planned Programs Subtotals	149.597	172.361	166.603

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605018A / <i>Integrated Personnel and Pay System-Army (IPPS-A)</i>	Project (Number/Name) ED9 / <i>Integrated Personnel and Pay System - Army Inc 2</i>
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• B66706: <i>Army Integrated Personnel and Pay System - Army (IPPS-A)</i>	4.214	16.140	29.239	-	29.239	18.674	9.576	9.880	9.880	Continuing	Continuing
• Sustainment & Support: <i>OMA - Army Integrated Personnel and Pay System - Army (IPPS-A)</i>	-	44.646	72.586	-	72.586	93.665	91.716	90.289	90.013	Continuing	Continuing

Remarks

Comment: 0308610A (OMA) Funding will be used for the Operations and Maintenance support of IPPS-A, which includes civilian salaries, program office contractor office support, travel and training for program office personnel, software license renewal, and Help Desk support.

B66706000 (OPA) Funding will be used for initial system implementation and fielding of IPPS-A to include new equipment training (NET). Training delivery methods include Instructor-led Training, Distance Learning, and Computer Based Training of 13,000 personnel in FY 2019. Training products will be developed using the Oracle Usability Productivity Kit to include instructor manuals and lessons plans, as well as, Electronic Performance Support System and job aids. The deployment approach will implement pre-deployment activities at each location beginning 360 days in advance of deployment start date. Deployment will include on-site data conversion, workflow verification, and "over-the-shoulder" support.

D. Acquisition Strategy

IPPS-A Increment II will be developed in accordance with DoDI 5000.02, Enclosure 12 requirements and will deliver fully integrated personnel and pay services for all Army Components (Active, National Guard, and Reserve), building on the trusted database delivered by the IPPS-A Increment I program. IPPS-A Increment II will consist of four releases (Releases 2.0-5.0). Each release will build upon the previous release, providing pre-defined personnel and/or pay capabilities. IPPS-A will pursue a single Milestone (MS) B decision at the start of Increment II and a separate Authorization To Proceed (ATP) at the start of each subsequent release. Each release will also hold separate Preliminary and Critical Design Reviews prior to the start of development and test activities. Increment II Full Deployment Decision is anticipated at the conclusion of Release 4.0 when the system will provide integrated personnel and pay capabilities. IPPS-A achieved MS B on 14 December 2014.

Release 2.0-Standard Installation/Division Personnel System (SIDPERS): Begins in FY 2015 and delivers capability in FY 2018 building upon Increment I capabilities. Provides the functionality from PeopleSoft necessary to subsume the SIDPERS system for all ARNG locations. End-to-end Business Process development considerations will be evaluated to support various activities to include, but not limited to, promotions/demotions, training requirements, member benefits, duty status, and unit level manning.

Release 3.0-Accountability and Essential Personnel Services: Begins in FY 2017 and delivers capability in FY 2019 supporting accountability and essential personnel services necessary to subsume numerous legacy field systems including Electronic Military Personnel Office (eMILPO) and Total Army Personnel Database-Reserve (TAPDB-R). IPPS-A will establish a consolidated system that provides accountability and tracking of all personnel to include deployed Soldiers. It will allow

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605018A / <i>Integrated Personnel and Pay System-Army (IPPS-A)</i>	Project (Number/Name) ED9 / <i>Integrated Personnel and Pay System - Army Inc 2</i>
<p>Commanders in the field to access timely, accurate, and standardized personnel data for Soldiers in all components and provide the necessary means to identify Soldiers who should be on a payroll. In addition to delivering most of the functions required to establish an Army-wide HR system, Release 3.0 will bring HR payroll drivers on board to enhance accuracy of pay, credit for service, and benefits. IPPS-A will serve as the authoritative data source for all personnel within the system.</p> <p>Release 4.0-Pay Services: Begins in FY 2017 and delivers capability in FY 2020 focusing on pay services and building upon Release 2.0 and 3.0 to provide the basis for the fully integrated personnel and pay system. IPPS-A will incorporate pay functionality to include, but not limited to, base pay, taxes, allowances, bonuses, allotments and leave. At deployment, Release 4.0 will serve as the authoritative data source for all personnel and pay transactions within IPPS-A and will be able to produce initial data in support of Army audit goals.</p> <p>Release 5.0-Personnel Services: Begins in FY 2018 and delivers capability in FY 2020 focusing on the personnel services not yet addressed by the previous releases. Specifically, it will incorporate remaining functions related to record evaluation and retention management along with certain predominant manual activities.</p> <p><u>E. Performance Metrics</u> N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army											Date: February 2018				
Appropriation/Budget Activity 2040 / 5						R-1 Program Element (Number/Name) PE 0605018A / <i>Integrated Personnel and Pay System-Army (IPPS-A)</i>					Project (Number/Name) ED9 / <i>Integrated Personnel and Pay System - Army Inc 2</i>				

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	C/CPIF	Program oversight, resource justification, budget and programming, milestone and schedule tracking : Various	7.271	6.200	Jan 2017	4.070	Jun 2018	6.514	Jun 2019	-		6.514	Continuing	Continuing	Continuing
In-House Government Management Support	Allot	Program oversight, resource justification, budget and programming, milestone and schedule tracking : NCR	6.595	5.296	Apr 2017	3.955	Apr 2018	0.818	Apr 2019	-		0.818	Continuing	Continuing	Continuing
Subtotal			13.866	11.496		8.025		7.332		-		7.332	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software License -All Others	C/FFP	Various : Various	4.902	3.018	Jan 2017	3.518	Jan 2018	3.169	Jan 2019	-		3.169	Continuing	Continuing	Continuing
Software Licenses - IBM	C/FFP	Immixtechnology INC : McLean, Va	1.420	0.281	Feb 2017	1.075	Jan 2018	0.335	Jan 2019	-		0.335	Continuing	Continuing	Continuing
Software Licenses - GRC	C/FFP	Myhtics : Virginia Beach, VA	1.998	0.878	Jul 2017	1.098	Jun 2018	0.922	Jun 2019	-		0.922	Continuing	Continuing	Continuing
Software Ab Initio	C/FFP	Various : Various	1.046	1.902	Sep 2017	0.206	Mar 2018	1.067	Mar 2019	-		1.067	Continuing	Continuing	Continuing
Oracle Bundle - Software	SS/FFP	Oracle America INC : Reston, VA	15.378	2.271	May 2017	2.463	May 2018	2.271	May 2019	-		2.271	Continuing	Continuing	Continuing
Oracle - ULA	C/FFP	Myhtics : Virginia Beach, VA	1.876	1.876	May 2017	1.970	May 2018	1.960	May 2019	-		1.960	Continuing	Continuing	Continuing
Software Licenses- CA	SS/FFP	Immix Tech : McLean, VA	0.859	-		-		-		-		-	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0605018A / Integrated Personnel and Pay System-Army (IPPS-A)				Project (Number/Name) ED9 / Integrated Personnel and Pay System - Army Inc 2							
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Licenses -ESB	SS/FFP	Actuate Corp : San Mateo, CA	2.876	0.405	Aug 2017	0.469	Jul 2018	0.405	Jul 2019	-		0.405	Continuing	Continuing	Continuing
Software Product Level SME Consulting Support	SS/FFP	Various : Various	7.811	1.091	May 2017	3.549	May 2018	1.132	May 2019	-		1.132	Continuing	Continuing	Continuing
in House contract support of system development	C/CPFF	Various : Various	26.832	17.812	May 2017	16.390	May 2018	17.087	May 2019	-		17.087	Continuing	Continuing	Continuing
Functional in house contract support of system development-Army National Guard/Army Reserve/FMD	C/FFP	BAH : NCR	11.383	-		-		-		-		-	Continuing	Continuing	Continuing
Design, Development and Integration - Increment II	C/CPIF	CACI : Chantilly, VA	43.609	68.766	May 2017	66.323	May 2018	69.700	May 2019	-		69.700	Continuing	Continuing	Continuing
Network Support/ Production Hosting Services/Hardware Leasing	MIPR	Defense Information Systems Agency (DISA) Defense Enterprise Computing Center (DECC) : various	24.884	27.419	May 2017	36.400	May 2018	31.108	May 2019	-		31.108	Continuing	Continuing	Continuing
Software Licenses -m Factory C	C/FP	ACC -NJ : New Jersey	1.321	0.230	Sep 2017	0.255	Aug 2018	0.264	Aug 2019	-		0.264	Continuing	Continuing	Continuing
Software Licenses- PeopleSoft Enterprise Licenses	C/FFP	PeopleSoft : Pleasanton, CA	2.471	1.027	Nov 2016	1.248	Nov 2017	-		-		-	Continuing	Continuing	Continuing
Systems Interfaces	C/FFP/LOE	FMS, DMDC, GFEB, HRC : Various Locations	1.468	2.298		5.236	Jul 2018	14.000	Jul 2019	-		14.000	Continuing	Continuing	Continuing
Subtotal			150.134	129.274		140.200		143.420		-		143.420	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605018A / Integrated Personnel and Pay System-Army (IPPS-A)				ED9 / Integrated Personnel and Pay System - Army Inc 2							
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Facilities/Lease/Rents	MIPR	Facilities/Leases/Rents : Various	7.874	4.343	Oct 2016	5.220	Oct 2017	5.800	Oct 2018	-		5.800	Continuing	Continuing	Continuing
Equipment and Supplies MISC	Various	Various : Various	3.946	0.154	May 2017	1.143	May 2018	0.984	May 2019	-		0.984	Continuing	Continuing	Continuing
Subtotal			11.820	4.497		6.363		6.784		-		6.784	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Increment II-Government Acceptance Testing/Operational Test and Evaluation	MIPR	Various Government Agencies : Various	0.576	2.361	Oct 2016	8.416	Oct 2017	7.000	Oct 2018	-		7.000	Continuing	Continuing	Continuing
Increment II - Capability Acceptance Testing (CAT) /DT	Various	Government & Support Contractors : Various	2.743	1.969	Oct 2016	9.357	Oct 2017	2.067	Oct 2018	-		2.067	Continuing	Continuing	Continuing
Subtotal			3.319	4.330		17.773		9.067		-		9.067	Continuing	Continuing	N/A
Project Cost Totals			179.139	149.597		172.361		166.603		-		166.603	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605018A / <i>Integrated Personnel and Pay System-Army (IPPS-A)</i>	Project (Number/Name) ED9 / <i>Integrated Personnel and Pay System - Army Inc 2</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Release 2.0 - SIDPERS Functionality (ARNG)	[Redacted]																											
Release 2.0 - Critical Design Review (CDR)	[Redacted]																											
Release 2.0 - Configuration, Development, and Integration	[Redacted]																											
Release 2.0 - T & E	[Redacted]																											
Release 2.0 - Limited Fielding Decision	[Redacted]																											
Release 3.0 - Accountability and Essential Personnel Services (Active and USAR)	[Redacted]																											
Release 3.0 - In Progress Review (IPR)	[Redacted]																											
Release 3.0 - Integrated Baseline Review (IBR)	[Redacted]																											
Release 3.0 - Preliminary Design Review (PDR)	[Redacted]																											
Release 3.0 - Critical Design Review (CDR)	[Redacted]																											
Release 3.0 - Configuration, Development, and Integration	[Redacted]																											
Release 3.0 - T & E	[Redacted]																											
Release 3.0 - Limited Fielding Decision	[Redacted]																											

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605018A / <i>Integrated Personnel and Pay System-Army (IPPS-A)</i>	Project (Number/Name) ED9 / <i>Integrated Personnel and Pay System - Army Inc 2</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023											
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4								
Release 4.0 - Pay Services (All Compos)					Release 4.0 (All Compos)																															
Release 4.0 - In Progress Review (IPR)					4																															
Release 4.0 - Integrated Baseline Review (IBR)									5																											
Release 4.0 - Preliminary Design Review (PDR)													8																							
Release 4.0 - Critical Design Review (CDR)																	11																			
Release 4.0 - Configuration, Development, and Integration																	Development																			
Release 4.0 - T & E																					T & E															
Increment II MS C Equivalent																					16															
Release 4.0 - Full Deployment Decision (FDD)																									17											
Release 5.0 - Personnel Service (All Compos)									Release 5.0 (All Compos)																											
Release 5.0 - In Progress Review (IPR)																	10																			
Release 5.0 - Integrated Baseline Review (IBR)																					12															
Release 5.0 - Preliminary Design Review (PDR)																									13											

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605018A / <i>Integrated Personnel and Pay System-Army (IPPS-A)</i>	Project (Number/Name) ED9 / <i>Integrated Personnel and Pay System - Army Inc 2</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Release 5.0 - Critical Design Review (CDR)									15 ▲ CDR																			
Release 5.0 - Configuration, Development, and Integration									■ Development																			
Release 5.0 - T & E									■ T & E																			
Release 5.0 - Limited Fielding Decision									18 ▲ Limited Fielding Decision																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605018A / <i>Integrated Personnel and Pay System-Army (IPPS-A)</i>	Project (Number/Name) ED9 / <i>Integrated Personnel and Pay System - Army Inc 2</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Release 2.0 - SIDPERS Functionality (ARNG)	4	2015	4	2018
Release 2.0 - Critical Design Review (CDR)	3	2017	3	2017
Release 2.0 - Configuration, Development, and Integration	3	2017	1	2018
Release 2.0 - T & E	1	2018	4	2018
Release 2.0 - Limited Fielding Decision	4	2018	4	2018
Release 3.0 - Accountability and Essential Personnel Services (Active and AR)	3	2017	2	2019
Release 3.0 - In Progress Review (IPR)	3	2017	3	2017
Release 3.0 - Integrated Baseline Review (IBR)	4	2017	4	2017
Release 3.0 - Preliminary Design Review (PDR)	2	2018	2	2018
Release 3.0 - Critical Design Review (CDR)	3	2018	3	2018
Release 3.0 - Configuration, Development, and Integration	3	2018	4	2018
Release 3.0 - T & E	1	2019	2	2019
Release 3.0 - Limited Fielding Decision	3	2019	3	2019
Release 4.0 - Pay Services (All Compos)	1	2018	1	2020
Release 4.0 - In Progress Review (IPR)	1	2018	1	2018
Release 4.0 - Integrated Baseline Review (IBR)	1	2018	1	2018
Release 4.0 - Preliminary Design Review (PDR)	3	2018	3	2018
Release 4.0 - Critical Design Review (CDR)	1	2019	1	2019
Release 4.0 - Configuration, Development, and Integration	1	2019	3	2019
Release 4.0 - T & E	3	2019	1	2020
Increment II MS C Equivalent	4	2019	4	2019
Release 4.0 - Full Deployment Decision (FDD)	1	2020	1	2020

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605018A / <i>Integrated Personnel and Pay System-Army (IPPS-A)</i>	Project (Number/Name) ED9 / <i>Integrated Personnel and Pay System - Army Inc 2</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
Release 5.0 - Personnel Service (All Compos)	4	2018	2	2020
Release 5.0 - In Progress Review (IPR)	4	2018	4	2018
Release 5.0 - Integrated Baseline Review (IBR)	1	2019	1	2019
Release 5.0 - Preliminary Design Review (PDR)	2	2019	2	2019
Release 5.0 - Critical Design Review (CDR)	3	2019	3	2019
Release 5.0 - Configuration, Development, and Integration	3	2019	4	2019
Release 5.0 - T & E	4	2019	2	2020
Release 5.0 - Limited Fielding Decision	3	2020	3	2020

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605028A / <i>Armored Multi-Purpose Vehicle (AMPV)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	177.133	199.778	118.239	-	118.239	92.730	92.687	0.000	0.000	0.000	680.567
EB5: <i>Armored Multi-Purpose Vehicle</i>	-	177.133	199.778	118.239	-	118.239	92.730	92.687	0.000	0.000	0.000	680.567

A. Mission Description and Budget Item Justification

The Armored Multi-Purpose Vehicle (AMPV) is the materiel solution for replacement of the Army's Armored Personnel Carrier (M113) Family of Vehicles (FoV) within the Armored Brigade Combat Team (ABCT). It will mitigate current and future capability gaps in force protection, mobility, reliability, and interoperability across the Spectrum of Conflict. The AMPV will replace five mission roles currently performed by the M113 FoV by transferring the current M113 Mission Equipment Packages (MEP) to a new Military Vehicle Derivative (MVD) platform. In total, the AMPV FOV will account for approximately 30% of the ABCT's tracked fleet and consists of the following five variants:

1. Mission Command (MCmd) Vehicle: This platform enables effective mission command planning and execution for both the Tactical Operations Center (TOC) and Tactical Command Vehicle (TAC) versions of the MCmd. It will host current Battle Command Systems, future replacements, and upgrades of hardware and software.
2. Medical Treatment (MT) Vehicle: This platform will provide a protected surgical environment, with adequate lighting and accessible medical equipment. It will provide a capability for immediate medical care for one patient by a medical crew of four.
3. Medical Evacuation (ME) Vehicle: This platform will conduct ambulance type activities and provide casualty evacuation for up to four litter or six ambulatory patients, with a crew of three medical attendants.
4. General Purpose (GP) Vehicle: This platform will operate throughout the battle space by conducting re-supply, maintenance, casualty evacuation, and other tasks within the formation.
5. Mortar Carrier (MC) Vehicle: This platform will provide immediate responsive fire support to conduct fast-paced offensive operations.

The AMPV program has been initiated on the basis of a Capability Development Document (CDD) that was approved on 21 June 2013 and subsequently revised on 24 October 2016. The CDD reflects a set of stable, technologically achievable requirements. A Milestone B (MS B) Defense Acquisition Board (DAB) was held on 9 December 2014 and it was followed by an Acquisition Decision Memorandum (ADM) that was signed on 22 December 2014. The ADM approved MS B for the AMPV program and entry into the Engineering and Manufacturing Development (EMD) phase. In addition, the ADM authorized the Army to proceed with award of the EMD prime contract, which occurred on 23 December 2014 to BAE Systems Land & Armaments, L.P. (BAE). The FY2019 Planned Program consists of completion of EMD testing (including all Development Testing and the Limited User Test), completion of the System Verification Review / Production Readiness Review, completion of the program level Milestone C Review, continued efforts related to Logistics Support products (including completion of a Logistics Demonstration, completion of the entire Technical Manual validation, and the start of Interactive Electronic Technical Manual (IETM) verification), and initiation of efforts that support Production Qualification Testing.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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 0605028A / <i>Armored Multi-Purpose Vehicle (AMPV)</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	184.221	199.778	123.264	-	123.264
Current President's Budget	177.133	199.778	118.239	-	118.239
Total Adjustments	-7.088	0.000	-5.025	-	-5.025
• Congressional General Reductions	-0.090	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-6.998	-			
• Adjustments to Budget Years	-	-	-5.025	-	-5.025

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605028A / <i>Armored Multi-Purpose Vehicle (AMPV)</i>				Project (Number/Name) EB5 / <i>Armored Multi-Purpose Vehicle</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EB5: <i>Armored Multi-Purpose Vehicle</i>	-	177.133	199.778	118.239	-	118.239	92.730	92.687	0.000	0.000	0.000	680.567
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Armored Multi-Purpose Vehicle (AMPV) is the materiel solution for replacement of the Army's Armored Personnel Carrier (M113) Family of Vehicles (FoV) within the Armored Brigade Combat Team (ABCT). It will mitigate current and future capability gaps in force protection, mobility, reliability, and interoperability across the Spectrum of Conflict. The AMPV will replace five mission roles currently performed by the M113 FoV by transferring the current M113 Mission Equipment Packages (MEP) to a new Military Vehicle Derivative (MVD) platform. In total, the AMPV FOV will account for approximately 30% of the ABCT's tracked fleet and consists of the following five variants:

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2. Medical Treatment (MT) Vehicle: This platform will provide a protected surgical environment, with adequate lighting and accessible medical equipment. It will provide a capability for immediate medical care for one patient by a medical crew of four.
3. Medical Evacuation (ME) Vehicle: This platform will conduct ambulance type activities and provide casualty evacuation for up to four litter or six ambulatory patients, with a crew of three medical attendants.
4. General Purpose (GP) Vehicle: This platform will operate throughout the battle space by conducting re-supply, maintenance, casualty evacuation, and other tasks within the formation.
5. Mortar Carrier (MC) Vehicle: This platform will provide immediate responsive fire support to conduct fast-paced offensive operations.

The AMPV program has been initiated on the basis of a Capability Development Document (CDD) that was approved on 21 June 2013 and subsequently revised on 24 October 2016. The CDD reflects a set of stable, technologically achievable requirements. A Milestone B (MS B) Defense Acquisition Board (DAB) was held on 9 December 2014 and it was followed by an Acquisition Decision Memorandum (ADM) that was signed on 22 December 2014. The ADM approved MS B for the AMPV program and entry into the Engineering and Manufacturing Development (EMD) phase. In addition, the ADM authorized the Army to proceed with award of the EMD prime contract, which occurred on 23 December 2014 to BAE Systems Land & Armaments, L.P. (BAE). The FY2019 Planned Program consists of completion of EMD testing (including all Development Testing and the Limited User Test), completion of the System Verification Review / Production Readiness Review, completion of the program level Milestone C Review, continued efforts related to Logistics Support products (including completion of a Logistics Demonstration, completion of the entire Technical Manual validation, and the start of Interactive Electronic Technical Manual (IETM) verification), and initiation of efforts that support Production Qualification Testing.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605028A / <i>Armored Multi-Purpose Vehicle (AMPV)</i>	Project (Number/Name) EB5 / <i>Armored Multi-Purpose Vehicle</i>

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: Armored Multi-Purpose Vehicle (AMPV) Product Development</p> <p>Description: AMPV Product Development costs include all efforts provided under the AMPV EMD prime contract along with Government Furnished Material (GFM). Significant examples of prime contract effort include: development engineering, system engineering/program management, prototype hardware procurement, prototype system level fabrication and integration, software development, support to the government test program, and oversight of subcontractors/suppliers. Also included are all efforts performed by subcontractors/suppliers who are under contract to the AMPV EMD prime contractor. This element also includes the recurring manufacturing cost to procure the vehicles that will support Full-Up System Level (FUSL) live fire testing.</p> <p>FY 2018 Plans: Prime contractor activities in FY2018 will consist of efforts that support the conduct of system level tests and efforts that are necessary as a result of the tests. In addition, the contractor will continue work related to Logistics/Product Support. All 29 prototypes will undergo testing in FY2018, with tests often occurring simultaneously at multiple locations. The contractor will support these tests by providing Field Service Representatives (FSRs) to assist in repairing and maintaining the prototypes and by providing Subject Matter Experts (SMEs) to troubleshoot any issues that might arise during testing. As required, the contractor will update the AMPV designs to address any shortcomings that are uncovered during testing or to incorporate any updates to government performance requirements. A Corrective Action Period (CAP) is planned for late 1QFY2018 through late 2QFY2018. During the CAP, the contractor will incorporate any design changes that are deemed necessary. An Interim Design Review (IDR) will be conducted at the conclusion of the CAP. The IDR will demonstrate that design changes made after the CDR are baselined and the system design is ready for manufacturing. A minimum of seventeen (17) artifacts will be generated by the contractor in support of IDR. Additional system level testing will take place following the CAP. At least 9,950 miles (not including contractor shakedown testing) will accrue during formal government testing prior to the CAP and at least an additional 9,500 miles will accrue following the CAP. Following completion of the post-CAP system level tests, a Functional Configuration Audit (FCA) will occur 4QFY2018. During the FCA, the contractor will demonstrate that the as-tested performance of the vehicles complies with design and interface requirements. Immediately following the FCA, the contractor will support the Limited User Test (LUT) in 4QFY2018. Eighteen (18) of the prototypes will be used during the LUT and the contractor will support the test by having FSRs and Test Engineers (TEs) on site and SMEs on call. Besides ensuring that the prototypes are adequately supported before and during testing, the contractor will provide all facilities, parts, tools, and other support items necessary to conduct a Logistics Demonstration (Log Demo) 2-4QFY2018. The contractor will validate the logistics support package prior to</p>	123.033	141.000	75.639	-	75.639

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605028A / <i>Armored Multi-Purpose Vehicle (AMPV)</i>	Project (Number/Name) EB5 / <i>Armored Multi-Purpose Vehicle</i>

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>the Log Demo and will ensure that the nine (9) primary objectives of the Log Demo are achieved. The first Low Rate Initial Production (LRIP) contract option covers 52 vehicles, 10 of which (2 of each variant type) will support Full-Up System Level (FUSL) live fire testing. The recurring manufacturing cost associated with these 10 live fire assets will be Research, Development, Test, and Evaluation (RDT&E) funded, while the remaining 42 vehicles will be Procurement funded. Further, the live fire testing is scheduled to begin 2QFY2020 and the lead times associated with select hardware, such as electronic components, is expected to be such that some items must be procured as early as 3QFY2018. In accordance with the Full Funding Policy, the entire procurement cost of the live fire test assets is being budgeted in the fiscal year in which select items are initially procured. Accordingly, the FY2018 cost in this element includes the full recurring manufacturing cost necessary to procure 10 FUSL live fire test assets.</p> <p><i>FY 2019 Base Plans:</i> Prime contractor activities in FY2019 consist of efforts that support the completion of the Engineering and Manufacturing Development (EMD) contract. The contractor will provide support that leads to completion of EMD testing activities at government test locations; including Electromagnetic Interference (EMI) testing at the Electronic Proving Ground (EPG), system live fire testing of prototypes at Aberdeen Proving Ground (APG), and Limited User Testing (LUT) at a location to be determined. All testing activities are planned to be complete by the end of 1QFY2019. As required, the contractor will analyze the results of the testing program and then incorporate any necessary design changes into selected prototypes. In addition to test support, the contractor will complete a System Verification Review / Production Readiness Review (SVR/PRR) 1QFY2019. The SVR/PRR will be a formal examination of the program to ensure that the AMPV design is ready for production and that the contractor has accomplished adequate production planning. As part of the AMPV design assessment, the contractor may also evaluate the capabilities of the AMPV design to satisfy other emerging Army requirements. Based on all engineering design work completed under the EMD contract, the contractor will also complete and deliver a final Technical Data Package (TDP) no later than 60 days prior to the end of the contract (3QFY2019). A final significant area of effort for the prime contractor during completion of the EMD contract is continued work related to Logistics Support. This includes completion of the Logistics Demonstration, completion of the entire Technical Manual validation, and the start of Interactive Electronic Technical Manual (IETM) verification. In addition, and in support of Milestone C, the contractor will support an update to the Life Cycle Sustainment Plan (LCSP), completion of the Product Support Business Case Analysis, completion of the Depots Source of Repair (DSOR) Analysis, completion of the Core Depot Assessment (CDA), and completion of the Item Unique Identification (IUID) Plan. Following completion of Milestone C (currently planned for 2QFY2019), the program will exercise the existing option for the first year of Low Rate Initial Production</p>					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605028A / <i>Armored Multi-Purpose Vehicle (AMPV)</i>	Project (Number/Name) EB5 / <i>Armored Multi-Purpose Vehicle</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>(LRIP-1). Under the LRIP-1 contract option, the prime contractor will provide support to planned Production Qualification Testing (PQT) and, therefore, this element also includes costs related to PQT support. FY2019 prime contractor efforts will include support to PQT planning and the identification/procurement of System Support Packages (SSPs) that will be required for PQT. Also in support of PQT, the Government will procure selected mission equipment for the PQT test articles.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Decrease due to completion of the EMD phase of the program in FY2019 and transitioning into the Low Rate Initial Production (LRIP) phase</p>					
<p>Title: AMPV Government Program Management Costs</p> <p>Description: AMPV Government Program Management costs include efforts to provide Government oversight of the AMPV program. This includes Systems Engineering and Program Management. Government and support Contractor salaries are included, as well as travel and other support costs that are required to effectively manage the program. Costs in this category do not include Government Furnished Material or efforts that are specific and unique to end item testing that is performed at Government test locations.</p> <p>FY 2018 Plans: Provide integrated program management for all development activities, to include providing oversight to BAE. Eight Integrated Product Teams will continue to oversee the technical development efforts of BAE in order to monitor and track progress related to the achievement of overall system performance requirements. This includes review and acceptance of all formal contract deliverables and test reports. The AMPV Earned Value Management (EVM) team will continue to evaluate cost and schedule performance against the established Performance Measurement Baseline (PMB) and Integrated Master Schedule (IMS). There will be two overarching areas of emphasis for the Government Project Management team in FY2018: continuing to manage and oversee the EMD effort and preparing to transition the program into the Low Rate Initial Production (LRIP) phase. For the EMD effort, the team will provide oversight to the test program, ensure the successful completion of the Logistics Demonstration, and complete the Interim Design Review (IDR) and the Functional Configuration Audit (FCA), In preparation for the transition to LRIP, the team will prepare the approximately forty (40) documents that will be necessary to support the 2QFY2019 Milestone C review and will also execute the option to the EMD contract that covers LRIP 1.</p> <p>FY 2019 Base Plans:</p>	29.300	24.564	22.100	-	22.100

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605028A / <i>Armored Multi-Purpose Vehicle (AMPV)</i>	Project (Number/Name) EB5 / <i>Armored Multi-Purpose Vehicle</i>

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Provide integrated program management for all development activities, to include providing oversight to BAE. Eight Integrated Product Teams will continue to oversee the technical development efforts of BAE in order to monitor and track progress related to the achievement of overall system performance requirements. This includes review and acceptance of all formal contract deliverables and test reports. The AMPV Earned Value Management (EVM) team will continue to evaluate cost and schedule performance against the established Performance Measurement Baseline (PMB) and Integrated Master Schedule (IMS). There will be three overarching areas of emphasis for the Government Project Management team in FY2019: completion of the EMD phase of the program, completion of the program level Milestone C (MS C), and initiation of Low Rate Initial Production (LRIP). For completion of EMD, the team will participate in, and review artifacts for, the System Verification Review / Production Readiness Review (SVR/PRR). In addition, the team will ensure all final EMD deliverables are in accordance with contract requirements and will support any other contract close out efforts. For Milestone C, the team will finalize the required documents and will participate in meetings/reviews that lead to the actual review 2QFY2019. Related to LRIP, the team will provide oversight to the prime contractor. The effort related to LRIP is limited to only those activities that are traceable to Production Qualification Testing. All other Government Program Management efforts in support of LRIP will be covered by Procurement funding. Finally, as required, the AMPV Government Project Management team may support Army planning by initiating efforts that relate to the AMPV design possibly being used to satisfy other emerging Army requirements.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Decrease due to program transitioning from RDTE funded Program Management Support to Production funded Program Management Support.</p>					
<p>Title: Government Test Costs</p> <p>Description: Government Test costs are for efforts required to perform and validate system-related tests. This element includes costs of the detailed planning, conduct, support, data reduction, and reports from such testing. Also included are costs necessary to acquire data during the conduct of the Government tests. The actual test articles (i.e., functionally configured systems) are excluded from this element. Also excluded are prime contractor costs incurred in support of the Government system level test.</p> <p>FY 2018 Plans: System level performance, reliability, and operational testing will take place throughout FY2018. Twenty one (21) of the twenty nine (29) prototypes will be part of the formal government testing program. The remaining eight (8) prototypes will remain at the contractor's location and will support trouble shooting and the Logistics Demonstration. The Government testing will occur at three primary locations: the Aberdeen Test Center (ATC)</p>	24.800	34.214	20.500	-	20.500

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605028A / <i>Armored Multi-Purpose Vehicle (AMPV)</i>	Project (Number/Name) EB5 / <i>Armored Multi-Purpose Vehicle</i>

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>will complete reliability, automotive and vehicle performance, software, and safety testing; the Yuma Test Center (YTC) will complete reliability, sand and dust, hot and cold weather climatic performance, full load cooling, toxic fume firing evaluation, and hot and cold gunnery testing; and the Electronic Proving Ground (EPG) will conduct C4ISR performance, intra-vehicular electromagnetic interference, and information assurance testing. The exact site for the Limited User Test (LUT) in 4QFY2018 has not yet been determined, but will likely take place in the Southwest United States. The majority of the costs in FY2018 are for the actual conduct of the tests at the aforementioned locations. This includes the costs related to facility/range usage and data collection. In addition, dedicated personnel from a variety of Army organizations outside of the Project Management Office (i.e., Army Test and Evaluation Command, Army Environmental Command, Army Research Laboratory, Army Materiel Systems Analysis Activity, Army Combined Arms Support Command, Army Threat Systems Management Office, and Army Operational Test Command) will be required and are included in this element. The Army test community will commence Test and Evaluation Master Plan (TEMP) updates and coordination in support of Milestone C.</p> <p>FY 2019 Base Plans: Government Test costs in FY2019 reflect the completion of EMD testing, test data evaluation and final reporting, and the commencement of test planning for Production Qualification Testing (PQT). All Developmental Testing (DT) will be completed 1-2QFY2019. This will include Electromagnetic Interference (EMI) testing at the Electronic Proving Ground (EPG). System level Live Fire (LF) testing of prototypes (which starts in FY2018) will likewise be completed in FY2019. The Limited User Test (LUT) is scheduled to be completed in 1QFY2019. All the LUT follow-up evaluations, surveys, and final Data Authentication Groups will be completed and the Army Test and Evaluation Command will complete the Operational Test Command Milestone Assessment Report (OMAR). The Army test community will finalize the AMPV Milestone C Test and Evaluation Master Plan (TEMP) and will staff the TEMP for Army and Department of Defense level approvals. In FY2019 the detailed test planning for PQT (Performance and RAM) will be take place and be finalized to support testing in FY2020. The Full-Up System Level (FUSL) live fire test planning efforts will also commence. Test ammunition and test threat management, forecasting, and procurement will continue for future test efforts.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Decrease due to completion of EMD testing in FY2019..</p>					
Accomplishments/Planned Programs Subtotals	177.133	199.778	118.239	-	118.239

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605028A / <i>Armored Multi-Purpose Vehicle (AMPV)</i>	Project (Number/Name) EB5 / <i>Armored Multi-Purpose Vehicle</i>

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• G80819: <i>Armored Multi Purpose Vehicle (AMPV)</i>	-	447.618	479.801	230.359	710.160	486.557	826.316	599.540	621.139	9,179.670	12,871.000

Remarks

D. Acquisition Strategy

The Armored Multi-Purpose Vehicle (AMPV) program entered the acquisition process at Milestone B. This was accomplished via an Acquisition Decision Memorandum (ADM) that was signed on 22 December 2014. The ADM also authorized the Army to proceed with award of the Engineering and Manufacturing Development (EMD) prime contract with three Low Rate Initial Production (LRIP) options. The contract was awarded on 23 December 2014 to BAE Systems Land & Armaments, L.P. (BAE). The award was on a competitive basis utilizing formal Source Selection Evaluation Board (SSEB).

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army											Date: February 2018				
Appropriation/Budget Activity 2040 / 5						R-1 Program Element (Number/Name) PE 0605028A / Armored Multi-Purpose Vehicle (AMPV)					Project (Number/Name) EB5 / Armored Multi-Purpose Vehicle				

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Development Engineering	C/CPIF	BAE : Sterling Heights, MI	121.000	44.133	Dec 2016	23.574	Dec 2017	18.011	Dec 2018	-		18.011	0.000	206.718	-
Prototype Material Contractor	C/CPIF	BAE : Sterling Heights, MI	75.700	17.200	Dec 2016	-		-		-		-	0.000	92.900	-
Prototype Material Government Furnished	Various	Various : .	21.200	-		4.026	Dec 2017	2.400	Dec 2018	-		2.400	0.000	27.626	-
Contractor System Engineering, Data, Test and Program Management	C/CPIF	BAE : Sterling Heights, MI	50.600	61.700	Dec 2016	83.122	Dec 2017	16.000	Dec 2018	-		16.000	0.000	211.422	-
Procurement of Live Fire Test Assets	Option/ FPIF	BAE : York, PA	-	-		30.278	Dec 2017	-		-		-	0.000	30.278	-
Contractor Support to Qualification, Live Fire, & Operational Testing	C/CPIF	BAE : Sterling Heights, MI	-	-		-		39.228	Dec 2018	-		39.228	84.580	123.808	-
Subtotal			268.500	123.033		141.000		75.639		-		75.639	84.580	692.752	N/A

Remarks
Armored Multi Purpose Vehicle Tech data and system level product development costs.

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support	MIPR	PMO : Warren, MI	53.600	29.300	Dec 2016	24.564	Dec 2017	22.100	Dec 2018	-		22.100	15.000	144.564	-
Subtotal			53.600	29.300		24.564		22.100		-		22.100	15.000	144.564	N/A

Remarks
Armored Multi Purpose Vehicle Support Costs.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0605028A / <i>Armored Multi-Purpose Vehicle (AMPV)</i>				Project (Number/Name) EB5 / <i>Armored Multi-Purpose Vehicle</i>							
Test and Evaluation (\$ in Millions)															
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
				Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government System Testing	MIPR	Various : .	7.000	24.800	Dec 2016	34.214	Dec 2017	20.500	Dec 2018	-		20.500	88.110	174.624	-
Subtotal			7.000	24.800		34.214		20.500		-		20.500	88.110	174.624	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			329.100	177.133		199.778		118.239		-		118.239	187.690	1,011.940	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605028A / Armored Multi-Purpose Vehicle (AMPV)	Project (Number/Name) EB5 / Armored Multi-Purpose Vehicle

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Production Prove Out Test																												
Limited User Test																												
Milestone C																												
Low Rate Initial Production 1																												
Initial Operational Test & Evaluation																												
First Unit Equipped																												
Full Rate Production Decision																												
Initial Operational Capability																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605028A / <i>Armored Multi-Purpose Vehicle (AMPV)</i>	Project (Number/Name) EB5 / <i>Armored Multi-Purpose Vehicle</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Production Prove Out Test	3	2017	3	2018
Limited User Test	4	2018	1	2019
Milestone C	2	2019	2	2019
Low Rate Initial Production 1	2	2019	2	2019
Initial Operational Test & Evaluation	2	2021	3	2021
First Unit Equipped	4	2021	4	2021
Full Rate Production Decision	1	2022	1	2022
Initial Operational Capability	2	2022	2	2022

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0605029A / Integrated Ground Security Surveillance Response Capability (IGSSR-C)
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	4.789	4.418	3.211	-	3.211	5.780	0.000	0.000	0.000	0.000	18.198
EQ2: <i>IntegGrdSecSurvRespC(IGSSR-C)</i>	-	4.789	4.418	3.211	-	3.211	5.780	0.000	0.000	0.000	0.000	18.198

Note

Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) was funded in Integrated Base Defense (IBD) Program Element: 0205402A EF2 in FY 2016

A. Mission Description and Budget Item Justification

IGSSR-C: The Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) is an Automated Information System (AIS) program. IGSSR-C has a requirement to provide a layered approach to integrate sensors, sensor systems and unmanned systems with automated fusion capabilities. The system will provide a Force Protection (FP) Common Operational Picture (COP) capability for CONUS fixed, OCONUS semi-fixed or expeditionary elements in all Operating Environments (OE).

This capability will enable rapid decision analysis, speed the response process as well as increase information dissemination horizontally and vertically along the chain of command and with outside supporting organizations. IGSSR-C is a software centric fusion engine that connects legacy and emerging FP systems, legacy Chemical, Biological, Radiological, and Nuclear (CBRN), unmanned systems, biometric identification and forensic data systems. The desired end state is to achieve interoperability and COP with current and emerging FP systems used by Joint Forces, Department of Defense (DoD) agencies and multi-national forces.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	4.980	4.418	1.324	-	1.324
Current President's Budget	4.789	4.418	3.211	-	3.211
Total Adjustments	-0.191	0.000	1.887	-	1.887
• Congressional General Reductions	-0.002	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.189	-			
• Adjustments to Budget Years	-	-	1.887	-	1.887

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605029A / <i>Integrated Ground Security Surveillance Response Capability (IGSSR-C)</i>	

Change Summary Explanation

FY 2019 increase of \$1.887 million is due to an adjustment required to align funding with planned acquisition strategy.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605029A / <i>Integrated Ground Security Surveillance Response Capability (IGSSR-C)</i>					Project (Number/Name) EQ2 / <i>IntegGrdSecSurvRespC(IGSSR-C)</i>		
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EQ2: <i>IntegGrdSecSurvRespC(IGSSR-C)</i>	-	4.789	4.418	3.211	-	3.211	5.780	0.000	0.000	0.000	0.000	18.198
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) was funded in Integrated Base Defense (IBD) Program Element: 0205402A EF2 in FY 2016.

A. Mission Description and Budget Item Justification

IGSSR-C: The Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) is an Automated Information System (AIS) program. IGSSR-C has a requirement to provide a layered approach to integrate sensors, sensor systems and unmanned systems with automated fusion capabilities. The system will provide a Force Protection (FP) Common Operational Picture (COP) capability for CONUS fixed, OCONUS semi-fixed or expeditionary elements in all Operating Environments (OE).

This capability will enable rapid decision analysis, speed the response process as well as increase information dissemination horizontally and vertically along the chain of command and with outside supporting organizations. IGSSR-C is a software centric fusion engine that connects legacy and emerging FP systems, legacy Chemical, Biological, Radiological, and Nuclear (CBRN), unmanned systems, biometric identification and forensic data systems. The desired end state is to achieve interoperability and COP with current and emerging FP systems used by Joint Forces, Department of Defense (DoD) agencies and multi-national forces.

FY 2019 Base Funding in the amount of \$3.211 million supports completion of Integrated Ground Security, Surveillance and Response -Capability (IGSSR-C) software baseline. This funding also supports Critical Design Review (CDR), Developmental and Limited User Test (LUT) events, and modeling and simulation.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: IGSSR-C Design and Development	4.789	4.418	3.211	-	3.211
Description: Completes IGSSR-C design efforts and initiates software integration activities.					
FY 2018 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605029A / <i>Integrated Ground Security Surveillance Response Capability (IGSSR-C)</i>	Project (Number/Name) EQ2 / <i>IntegGrdSecSurvRespC(IGSSR-C)</i>

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue development and implementation of all technical requirements. Completes Preliminary Design Review (PDR) and supports participation in Technical Support Operational Analysis (TSOA) events. Provides for Program Management Support (PMO) support and modeling and simulation efforts.					
<i>FY 2019 Base Plans:</i> FY 2019 Plans: Complete development and implementation of all technical requirements. Complete Critical Design Review (CDR) and supports Developmental Testing and Limited User Testing (LUT). Provides support to modeling and simulation efforts.					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Change in funding level from FY 2018 to FY 2019 is due to completion of architecture framework and realignment of government Program Management Office (PMO) support funds from RDT&E to Operations and Maintenance Army (OMA).					
Accomplishments/Planned Programs Subtotals	4.789	4.418	3.211	-	3.211

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

Line Item	FY 2017	FY 2018	FY 2019			FY 2020	FY 2021	FY 2022	FY 2023	Cost To	
			Base	OCO	Total					Complete	Total Cost
• M90106: <i>Base Defense Systems (BDS)</i>	26.572	3.726	0.000	39.200	39.200	-	0.727	0.705	2.362	0.000	73.292

Remarks

D. Acquisition Strategy

The Integrated Ground Security, Surveillance and Response Capability (IGSSR-C) provides a layered approach to integrate sensors, sensor systems and unmanned systems. The IGSSR-C Capability Design Document (CDD) was approved September 2013. IGSSR-C is made up of a suite of software that achieves integration, fusion and interoperability in support of the Army Acquisition Executive's Common Operating Environment (COE) Command Post Compute Environment (CPCE) and Sensor CE efforts.

In FY 2014, the Department of Defense (DoD) Physical Security Enterprise and Analysis Group (PSEAG) provided funds to conduct pre-milestone B activities. IGSSR-C received an approved Materiel Development Decision (MDD) from the Milestone Decision Authority (MDA) on 4 December 2015. The acquisition strategy for IGSSR-C was approved on 5 December 2016 by the MDA, which approved plans to leverage a Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, Virginia

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605029A / <i>Integrated Ground Security Surveillance Response Capability (IGSSR-C)</i>	Project (Number/Name) EQ2 / <i>IntegGrdSecSurvRespC(IGSSR-C)</i>

delivery order to develop, integrate and test the Initial Capability (IC). Milestone C is planned for FY 2020 to align Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) and Tactical Security System (TSS) in order to gain programmatic efficiencies.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army											Date: February 2018				
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0605029A / <i>Integrated Ground Security Surveillance Response Capability (IGSSR-C)</i>				Project (Number/Name) EQ2 / <i>IntegGrdSecSurvRespC(IGSSR-C)</i>							

Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
IGSSR-C Project Management	MIPR	PM FPS : Fort Belvoir, VA	-	0.151	Dec 2016	0.309		-		-		-	0.000	0.460	-
IGSSR-C Independent Software Assessment	MIPR	Carnegie Mellon University Software Engineering Institute : Pittsburgh, PA	-	-		0.340		-		-		-	Continuing	Continuing	Continuing
Subtotal			-	0.151		0.649		-		-		-	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
IGSSR-C Design	C/CPFF	NVESD/MTEQ : Ft. Belvoir	-	1.873	Oct 2017	2.601		1.959	Feb 2019	-		1.959	Continuing	Continuing	Continuing
IGSSR-C Prototypes	C/CPFF	NVESD/MTEQ : Ft. Belvoir	-	1.865	Oct 2017	-		-		-		-	Continuing	Continuing	Continuing
Subtotal			-	3.738		2.601		1.959		-		1.959	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
IGSSR-C Design Support	MIPR	RDECOM CERDEC : Fort Belvoir, VA	-	0.505	Dec 2016	0.193		0.156	Feb 2019	-		0.156	Continuing	Continuing	Continuing
Subtotal			-	0.505		0.193		0.156		-		0.156	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army											Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605029A / <i>Integrated Ground Security Surveillance Response Capability (IGSSR-C)</i>					Project (Number/Name) EQ2 / <i>IntegGrdSecSurvRespC(IGSSR-C)</i>			

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
IGSSR-C Test and Evaluation	MIPR	A TEC : Aberdeen Proving Ground, MD	-	0.395	Dec 2016	0.230		0.746	Feb 2019	-		0.746	Continuing	Continuing	Continuing
IGSSR-C Modeling and Simulation	MIPR	Night Vision and Electronic Sensors Directorate : Ft. Belvoir, VA	-	-		0.745		0.350	Feb 2019	-		0.350	Continuing	Continuing	Continuing
Subtotal			-	0.395		0.975		1.096		-		1.096	Continuing	Continuing	N/A
Project Cost Totals			-	4.789		4.418		3.211		-		3.211	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605029A / <i>Integrated Ground Security Surveillance Response Capability (IGSSR-C)</i>	Project (Number/Name) EQ2 / <i>IntegGrdSecSurvRespC(IGSSR-C)</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
IGSSR-C Risk Reduction	Risk Reduction																											
IGSSR-C Milestone B					1 MS B																							
IGSSR-C Development/Test/Integration					Dev/Test/Int																							
IGSSR-C Milestone C													2 MS C															
IGSSR-C Limited Deployment (LD)													Limited Deployment															
IGSSR-C Full Deployment Decision																	3 FDD											
IGSSR-C Full Deployment																	Full Deployment											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605029A / <i>Integrated Ground Security Surveillance Response Capability (IGSSR-C)</i>	Project (Number/Name) EQ2 / <i>IntegGrdSecSurvRespC(IGSSR-C)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
IGSSR-C Risk Reduction	4	2015	4	2017
IGSSR-C Milestone B	4	2017	4	2017
IGSSR-C Development/Test/Integration	1	2018	1	2020
IGSSR-C Milestone C	1	2020	1	2020
IGSSR-C Limited Deployment (LD)	1	2020	1	2021
IGSSR-C Full Deployment Decision	1	2021	1	2021
IGSSR-C Full Deployment	1	2021	1	2025

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>					R-1 Program Element (Number/Name) PE 0605030A / <i>Joint Tactical Networking Center</i>							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	14.463	15.877	15.889	-	15.889	5.723	5.834	5.836	5.491	Continuing	Continuing
EA8: <i>Joint Tactical Networking Center</i>	-	14.463	15.877	15.889	-	15.889	5.723	5.834	5.836	5.491	Continuing	Continuing

Note

Joint Tactical Networking Center (JTNC) is funded using a Joint budget strategy. Each Military Department (MILDEP) budgets for approximately one-third of the total program RDT&E requirements for joint efforts with the funding annually consolidated into the Army Program Element (PE) for execution. Fiscal Year (FY) 2017 to FY 2019 funding reflects the full JTNC requirement with the consolidated funding from the other Services, while FY 2020 and beyond reflects the Army one-third portion of total program RDT&E funds. Out year funding is held in PE 0605030A by the Army, PE 0605030N by the Navy and PE 0605030F by the Air Force.

A. Mission Description and Budget Item Justification

The JTNC is responsible for ensuring interoperable, secure, and cost effective waveform and wireless communications by recommending standards, conducting compliance and certification analyses in accordance with Department of Defense (DoD) policies, and maintaining a DoD Waveform Information Repository (IR). The JTNC provides: (1) DoD Waveform IR management and configuration control, (2) DoD waveform standards and Software Communications Architecture (SCA), (3) technical analyses of DoD Waveform IR products, and (4) serves as Technical Advisor to the JTNC Board of Directors (BoD).

This mission is executed in conjunction with other government agencies to include the National Security Agency (NSA), the Joint Interoperability Test Command (JITC), and the National Telecommunication and Information Administration (NTIA), as well as the Services. JTNC ensures that interagency work is collaborative and eliminates duplicative capability. The JTNC enables a common software baseline that is hardware agnostic, facilitating hardware and operating system independent capability-based applications, and provides for increased competition for Software Defined Radios.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	15.041	15.877	5.857	-	5.857
Current President's Budget	14.463	15.877	15.889	-	15.889
Total Adjustments	-0.578	0.000	10.032	-	10.032
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.571	-			
• Adjustments to Budget Years	-0.007	-	10.032	-	10.032

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

Appropriation/Budget Activity
2040: *Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)*

R-1 Program Element (Number/Name)
PE 0605030A / *Joint Tactical Networking Center*

Change Summary Explanation

FY17 reduction of \$.007 million attributed to Federally Funded Research and Development Centers.
FY19 increase (+\$10,032) is due to the consolidation of funding previously held by the other Services into the Army program element for execution to meet the full JTNC requirement.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605030A / <i>Joint Tactical Networking Center</i>					Project (Number/Name) EA8 / <i>Joint Tactical Networking Center</i>		
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EA8: <i>Joint Tactical Networking Center</i>	-	14.463	15.877	15.889	-	15.889	5.723	5.834	5.836	5.491	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

JTNC is funded using a Joint budget strategy. Each Military Department (MILDEP) budgets for approximately one-third of the total program RDT&E requirements for joint efforts with the funding consolidated annually into the Army PE for execution. FY2017-FY2019 reflects the full JTNC requirement with the consolidated funding from the other Services, while FY2020 and beyond reflects the Army one-third portion of total program RDT&E funds. Out year funding is held in PE 0605030A by the Army, PE 0605030N by the Navy and PE 0605030F by the Air Force.

A. Mission Description and Budget Item Justification

The JTNC is responsible for ensuring interoperable, secure, and cost effective waveform and wireless communications by recommending standards, conducting compliance and certification analyses in accordance with Department of Defense (DoD) policies, and maintaining a DoD Waveform Information Repository (IR). The JTNC provides: (1) DoD Waveform IR management and configuration control, (2) DoD waveform standards and Software Communications Architecture (SCA), (3) technical analyses of DoD Waveform IR products, and (4) serves as Technical Advisor to the JTNC Board of Directors (BoD).

This mission is executed in conjunction with other government agencies to include the National Security Agency (NSA), the Joint Interoperability Test Command (JITC), and the National Telecommunication and Information Administration (NTIA), as well as the Services. JTNC ensures that interagency work is collaborative and eliminates duplicative capability. The JTNC enables a common software baseline that is hardware agnostic, facilitating hardware and operating system independent capability-based applications, and provides for increased competition for Software Defined Radios.

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

	FY 2017	FY 2018	FY 2019
Title: DoD Waveform IR Support, Waveform Standards Evolution and Compliance & Certification Analysis	14.463	15.877	15.889
Description: Joint Tactical Networking Center (JTNC) aligns with the JTNC BoD, USD(AT&L), DoD CIO, Joint Staff, the Services, and other key stakeholders for those JTNC chartered processes that ensure interoperable, secure, and cost effective waveform and wireless communications. The JTNC: (1) Facilitates the reuse of waveform and wireless communications and fosters product capability improvements by making government owned waveform and wireless communications products available to developers, (2) provides open architecture DoD Waveform Standards in support of service, multiservice, and coalition forces, (3) provides certification recommendations on wireless communications products in support of service, multiservice, and coalition forces.			
FY 2018 Plans: Conducting analyses of Wideband Networking Waveform v4.2.2; and initiated analyses of Multifunction Advanced Data Link (MADL) and Uniform Minimum Essential Emergency Communications Network (MEECN) Code (UMM). The JTNC will initiate			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605030A / <i>Joint Tactical Networking Center</i>	Project (Number/Name) EA8 / <i>Joint Tactical Networking Center</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>collection of relevant software, technical documentation, cataloging and inducting other DoD Communication Waveforms listed in the DoD Communication Waveform Inventory. The JTNC will continue to enhance DoD Waveform IR capability and Software Communications Architecture (SCA) 4.1 promulgation. The JTNC will continue to evolve DoD Waveform Standards to facilitate common development, interoperability and re-use. The JTNC supports export requests and analyses of products for exportability.</p> <p>FY 2019 Plans: The JTNC will conduct analysis of three waveforms to include: Mobile User Objective System (MUOS) v3.1.5, Link 16 Concurrent Multi-Net (CMN4), and Second-Generation Anti-Jam Tactical UHF Radio for North Atlantic Treaty Organization (NATO) (SATURN). The JTNC will continue collecting relevant software, technical documentation, cataloging and inducting other DoD Communication Waveforms listed in the DoD Communication Waveform Inventory. The JTNC will continue to enhance DoD Waveform IR capability and Software Communications Architecture (SCA) evolution and promulgation. The JTNC will continue to evolve DoD Waveform Standards to facilitate common development, interoperability and re-use. The JTNC will support export requests and analyses of products for exportability.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase between FY18 and FY19 is due to inflation adjustments.</p>			
Accomplishments/Planned Programs Subtotals	14.463	15.877	15.889

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

N/A

Remarks

The Joint Tactical Networking Center is funded by all the Services. The Joint Funding Strategy requires each of the three Service Military Departments (MILDEPs) to budget for one-third of the total program approved requirement. Army funding in FY20 and beyond reflects only approximately one-third of total funding. Other funding is as follows:

Navy RDTE: 0605030N, 3077. FY20 = 4,536 // FY21 = 4,644 // FY22 = 4,741 // FY23 = 4,835

Air Force RDTE: 0605030F, 655068. FY20 = 5,588 // FY21 = 5,700 // FY22 = 5,814 // FY 23 = 5,930

Due to Joint Funding Strategy, there is no prior year funding for JTNC in the other Service lines. Prior to the year of execution, the JTNC funding is consolidated in Army PE 0605030A for execution. In accordance with the Joint Tactical Networking Center Charter updated and re-validated on 29 March 2016, the JTNC will remain under a Joint Budget Strategy funded by the three MILDEPs.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605030A / <i>Joint Tactical Networking Center</i>	Project (Number/Name) EA8 / <i>Joint Tactical Networking Center</i>

D. Acquisition Strategy

Joint Tactical Networking Center (JTNC) is classified as a Joint Support Program to Acquisition, Technology & Logistics (AT&L), DoD Chief Information Officer (CIO), and the Services. JTNC core functions as defined in the JTNC Acquisition Decision Memorandum and Charter signed on 20 January 2014 and re-validated on 29 March 2016 include: Department of Defense (DoD) Waveform Information Repository (IR) management and configuration control, DoD waveform standards and Software Communications Architecture (SCA), technical analyses of DoD Waveform IR products. The services derived from these core functions reinforce an acquisition environment where wireless communications products are interoperable, secure, and cost effective.

The FY2019 Budget supports continued development/maturation of the DoD Waveform IR, analysis of directed software and artifacts, support of the National Security Agency (NSA) Commercial Communications Security (COMSEC) Evaluation Program (CCEP), and the JTNC Standards Interface Control Working Group (ICWG).

E. Performance Metrics

Performance metrics are tracked and reported as part of the JTNC annual management plan. The goals, objectives, actions, targets and measurements are coordinated with stakeholders. Results are reported at regular intervals. Final accomplishments are reported to the JTNC Board of Directors.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605030A / Joint Tactical Networking Center	Project (Number/Name) EA8 / Joint Tactical Networking Center
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	Multiple Contract Awards : Various	6.401	0.244	Oct 2016	0.294	Oct 2017	0.210	Oct 2018	-		0.210	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	G2 Software Systems : San Diego, CA	1.162	0.848	Nov 2016	0.960	Nov 2017	0.890	Nov 2018	-		0.890	Continuing	Continuing	Continuing
Program Management Support	Allot	Aberdeen Proving Grounds : Aberdeen. MD	0.521	0.163	Oct 2016	0.173	Oct 2017	0.255	Oct 2018	-		0.255	Continuing	Continuing	Continuing
Program Management Support	MIPR	SSC PACIFIC : San Diego, CA	0.217	0.147	Oct 2016	-		-		-		-	0.000	0.364	0.364
Program Management Support	FFRDC	MITRE : McLean, VA	-	0.058	Dec 2016	-		-		-		-	0.000	0.058	0.058
Subtotal			8.301	1.460		1.427		1.355		-		1.355	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
JTNC Product Development Support	MIPR	SSC PACIFIC : San Diego, CA	1.997	1.210	Nov 2016	0.822	Nov 2017	0.572	Nov 2018	-		0.572	Continuing	Continuing	Continuing
JTNC Product Development Support	C/CPFF	G2 Software Systems : San Diego, CA	2.871	2.724	Oct 2016	2.950	Oct 2017	3.055	Oct 2018	-		3.055	Continuing	Continuing	Continuing
JTNC Product Development Support	MIPR	SSC ATLANTIC : Charleston, SC	-	-		0.053	Oct 2017	0.151	Oct 2018	-		0.151	Continuing	Continuing	Continuing
JTNC Product Development Support	MIPR	Various : Aberdeen. MD	-	-		1.160	Oct 2017	1.153	Oct 2018	-		1.153	Continuing	Continuing	Continuing
JTNC Product Development	C/CPFF	Booz Allen Hamilton : San Diego, CA	1.184	-		-		-		-		-	0.000	1.184	1.184

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605030A / Joint Tactical Networking Center	Project (Number/Name) EA8 / Joint Tactical Networking Center
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
JTNC Product Development - Other	Allot	Aberdeen Proving Grounds : Aberdeen, MD	0.382	-		-		-		-		-	0.000	0.382	0.382
Joint Tactical Networks (JTN) Legacy Development - MIPR	MIPR	Various : Various	19.868	-		-		-		-		-	0.000	19.868	19.868
Joint Tactical Networks (JTN) Legacy Development - Contracts	C/CPIF	Various : Various	24.890	-		-		-		-		-	0.000	24.890	24.890
Subtotal			51.192	3.934		4.985		4.931		-		4.931	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
JTNC Engineering/ Technical Support	C/CPFF	G2 Software Systems : San Diego, CA	2.700	1.794	Oct 2016	0.975	Oct 2017	0.771	Oct 2018	-		0.771	Continuing	Continuing	Continuing
JTNC Engineering/ Technical Support	FFRDC	MITRE Corporation : McLean, VA	0.500	0.167	Oct 2016	0.159	Oct 2017	0.151	Oct 2018	-		0.151	Continuing	Continuing	Continuing
JTNC Engineering/ Technical Support	MIPR	Aberdeen Proving Grounds : Aberdeen, MD	0.739	0.545	Oct 2016	0.741	Oct 2017	0.778	Oct 2018	-		0.778	Continuing	Continuing	Continuing
JTNC Engineering/ Technical Support	MIPR	SSC PACIFIC : San Diego, CA	0.595	0.639	Nov 2016	0.605	Nov 2017	0.706	Nov 2018	-		0.706	Continuing	Continuing	Continuing
JTNC Engineering/ Technical Support	MIPR	Various : San Diego, CA	-	-		0.877	Nov 2017	0.785	Nov 2018	-		0.785	Continuing	Continuing	Continuing
JTNC Engineering/ Technical Support	C/CPFF	Booz Allen Hamilton : San Diego	14.965	-		-		-		-		-	0.000	14.965	14.965
Subtotal			19.499	3.145		3.357		3.191		-		3.191	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605030A / Joint Tactical Networking Center	Project (Number/Name) EA8 / Joint Tactical Networking Center
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Development/Test & Evaluation	MIPR	SSC PACIFIC : San Diego, CA	2.552	1.475	Oct 2016	1.477	Oct 2017	2.124	Oct 2018	-		2.124	Continuing	Continuing	Continuing
Development/Test & Evaluation	C/CPFF	G2 Software Systems 01 : San Diego, CA	0.892	1.032	Oct 2016	4.315	Oct 2017	3.837	Oct 2018	-		3.837	Continuing	Continuing	Continuing
Development/Test & Evaluation	C/CPFF	Multiple Awards - JITC : Various	0.670	0.526	Oct 2016	0.144	Oct 2017	0.171	Oct 2018	-		0.171	Continuing	Continuing	Continuing
Development/Test & Evaluation	C/CPFF	Booz Allen Hamilton - NSA : Ft. Meade, MD	-	-		-		0.280	Dec 2018	-		0.280	Continuing	Continuing	Continuing
Development/Test & Evaluation	MIPR	National Security Agency : Ft. Meade, MD	0.277	0.326	Nov 2016	0.172	Nov 2017	-		-		-	0.000	0.775	0.775
Development/Test & Evaluation	C/CPFF	G2 Software Systems 04 : San Diego, CA	2.600	2.478	Nov 2016	-		-		-		-	0.000	5.078	5.078
Development/Test & Evaluation	MIPR	SSC ATLANTIC : Charleston, SC	0.073	0.087	Nov 2016	-		-		-		-	0.000	0.160	0.160
Development/Test & Evaluation	C/CPFF	Booz Allen Hamilton : San Diego, CA	1.242	-		-		-		-		-	0.000	1.242	1.242
Subtotal			8.306	5.924		6.108		6.412		-		6.412	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	87.298	14.463	15.877	15.889	-	15.889	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605030A / <i>Joint Tactical Networking Center</i>	Project (Number/Name) EA8 / <i>Joint Tactical Networking Center</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Waveform and Wireless Communication Product Compliance and	[Redacted]																											
	JTNC Waveform and Wireless Certification																											
DoD Waveform Information Repository	[Redacted]																											
	JTNC Information Repository																											
Evolve Waveform Standards and Software Communications Arch	[Redacted]																											
	JTNC Standards and SCA																											
Analyze Waveforms and Associated Artifacts	[Redacted]																											
	JTNC Analyses																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605030A / <i>Joint Tactical Networking Center</i>	Project (Number/Name) EA8 / <i>Joint Tactical Networking Center</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Waveform and Wireless Communication Product Compliance and Certification	1	2017	4	2023
DoD Waveform Information Repository	1	2017	4	2023
Evolve Waveform Standards and Software Communications Architecture (SCA)	1	2017	4	2023
Analyze Waveforms and Associated Artifacts	1	2017	4	2023

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	16.430	44.150	41.972	-	41.972	29.954	26.754	28.449	26.813	0.000	214.522
EF5: <i>Joint Tactical Network (JTN)</i>	-	9.676	14.210	11.156	-	11.156	4.466	3.558	3.324	5.565	0.000	51.955
EX6: <i>Waveforms</i>	-	6.754	29.940	30.816	-	30.816	25.488	23.196	25.125	21.248	0.000	162.567

Note

In FY 2013, Joint Tactical Networks (JTN) was funded in the Navy Program Element (PE) 0604280N (Joint Tactical Radio System (JTRS)), Project No.3076 (formally known as JTRS Network Enterprise Domain (JNED)). JNED was renamed JTN and the Joint Executive Program Office (JPEO) JTRS transitioned to the JTNC in FY 2013, in accordance with the Acquisition Decision Memorandum (ADM) dated 11 July 2012. FY 2013 and FY 2014 JTNC funding was provided by the JTN Program via PE 0604280N and PE 0605030A, respectively.

As per the JTNC ADM dated 20 January 2014, JTN and JTNC became separate entities and PE 0605031A (Project Code EF5) was created for JTN. The 2014 ADM also directed that the waveform development and sustainment responsibilities transition to the Services in 4QFY15. PdM Waveforms transitioned to PM TR; PdM Joint Enterprise Network Manager (JENM) transitioned to PEO C3T PM Warfighter Information Network-Tactical (WIN-T) PdM Tactical Cyber and Network Operations (TCNO); and Mobile User Objective System (MUOS) and Link16 transitioned to the Navy. For FY 2015 and out, the Army PE 0605031 contains only the JTN (Waveforms & JENM) RDT&E funding.

As part of the joint program budget strategy for JENM, each Military Department (MILDEP) budgets for approximately one-third of the total program RDT&E funds for joint efforts. Joint funding is held at the Navy PE 0605030N and Air Force PE 0605030F. Prior to the year of execution, the funding is consolidated in the Army PE (0605031A) for execution.

A. Mission Description and Budget Item Justification

Joint Tactical Networks (JTN) efforts are executed by PdM Waveforms and JENM. They are responsible for the portable, interoperable, mobile ad hoc networking waveforms and network enterprise services to enhance tactical warfighting capabilities. PdM Waveforms and JENM applications are: (1) Interoperable - among all Services, capable of operating in a variety of hardware items, for both Program of Record and commercial Non-Developmental Item (NDI) radios; (2) Secure - meet all DoD and US Government information assurance requirements; (3) Operationally relevant - quickly and effectively meet evolving network mission requirements of Combatant Commanders and the Services; (4) Affordable - drive down procurement and support costs via a robust, competitive Non-Developmental Item (NDI) market which adheres to open government standards.

In accordance with the Joint Tactical Networking Center (JTNC) Acquisition Decision Memorandum (ADM) and Charter dated 20 January, 2014, the JTN active efforts include Waveforms and JENM. Due to PdM Waveforms extensive knowledge and expertise, PdM Waveforms will continue to enhance, update, and sustain the following Legacy Waveforms on a reimbursable basis: the High Frequency (HF) waveform, the merged HAVE QUICK II (HQII) and Very High Frequency (VHF)/Ultra High

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>
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Frequency (UHF) Line of Sight (VULOS) waveforms, the Joint Tactical Radio System (JTRS) Bowman waveform (JBW), the Single Channel Ground and Airborne Radio System (SINCGARS) waveform and the UHF Satellite Communications (SATCOM) waveform.

EF5 project: The Joint Enterprise Network Manager (JENM) software provides the ability to plan, monitor, configure and control the Army's Software Defined Radio (SDR) communication networks. JENM configures numerous SDR radios such as the Manpack and Rifleman, enabling them to utilize the Mobile Ad Hoc Networking (MANET) waveforms such as the Soldier Radio Waveform (SRW), Wideband Networking Waveform (WNW), Mobile User Objective System (MUOS), Satellite Communications (SATCOM) Demand Assigned Multiple Access (DAMA), Integrated Waveform (IW), and Single Channel Ground and Airborne Radio System (SINCGARS) waveforms. Furthermore, JENM provides the Commander the ability to quickly reconfigure critical networks using its' Over the Air Management (OTAM) functionality. JENM enhances the S6's ability to conduct Course of Action (COA) Analysis and the Military Decision Making Process (MDMP) providing commanders critical information regarding their ability to effectively communicate.

EX6 project: Beginning in FY 2018, based on the results of the FY 2017 Army Network Analysis, the EX6 project will refocus efforts to improve waveforms for lower and mid-tier networks. The effort will focus on development to achieve improved performance, network simplification, improved spectrum efficiency and improved Electronic Warfare (EW)/Cyber resistance. The planned waveforms may include changes to a mid-tier waveform, SRW 2.0/Narrow Band, and SINCGARS upgrades. This new capability must be completed by FY20 -21 to support future tactical radio procurements.

FY 2019 Base RDTE dollars in the amount of \$41.972 million supports the continued development of the Waveforms and JENM, testing support and the program management office.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	16.014	44.150	41.175	-	41.175
Current President's Budget	16.430	44.150	41.972	-	41.972
Total Adjustments	0.416	0.000	0.797	-	0.797
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	1.008	-			
• SBIR/STTR Transfer	-0.592	-			
• Other Adjustments 1 - Waveforms	-	-	2.362	-	2.362
• Other Adjustments 2 - JENM	-	-	-1.565	-	-1.565

Change Summary Explanation

\$.592 million of FY 2017 reduction for SBIR / STTR Transfer.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	
<p>\$2.362 million of FY 2019 RDTE funds were identified to support SRW Narrowband Transition and integration efforts. This funding will provide support for the Narrowband capability to be transitioned from CERDEC to PdM Waveforms and integrated into the current waveform portfolio. (-\$2.435) million of FY 2019 RDTE funds were reduced for JENM development IAW tactical radio requirement updates.</p> <p>In accordance with the signed JTNC ADM and Charter dated 20 January 2014, Program Element (PE) 0605031A was established to execute JTN requirements in PB2015. FY 2015 was the first year funds were aligned to that PE. The Army has aligned their Service share of JENM and Waveform funding fully within the JTN PE for PB 2016. The Navy and Air Force funding for the JENM joint requirements remains in Navy PE 0605030N (shared) and Air Force PE 0605030F (shared). As part of the joint program budget strategy, each Military Department (MILDEP) budgets for approximately one-third of the total program RDT&E funds for joint efforts. Prior to the year of execution, the funding is consolidated in the Army PE for execution.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>				Project (Number/Name) EF5 / <i>Joint Tactical Network (JTN)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EF5: <i>Joint Tactical Network (JTN)</i>	-	9.676	14.210	11.156	-	11.156	4.466	3.558	3.324	5.565	0.000	51.955
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

For FY 2018 and out, the continuing JTN efforts are funded in Army PE 0605031A (JTN), Navy PE 0605031N (shared), Air Force PE 0605031F (shared) and USMC (Marine Corps Communications Systems - MCPC: 112107). As part of the JENM joint program budget strategy, the Air Force and Army budget for approximately one-third each of the total program funds for JENM efforts. The Navy and USMC funding combined equal the other third of the JENM program funding. Prior to the year of execution, Navy and Air Force funding is consolidated in the Army PE (0605031A) and software sustainment funds are realigned from RDT&E to O&M, A PE (4326750A) to support the joint program acquisition strategy. USMC funding will be provided on an annual basis via Military Interdepartmental Purchase Request (MIPR). USMC funding projections are as follows: FY18 - \$1.407M; FY19 - \$1.118M; FY20 - \$1.121M; FY21 - \$1.139M and FY22 - \$1.392M.

A. Mission Description and Budget Item Justification

The Joint Enterprise Network Manager (JENM) software provides the ability to plan, monitor, configure and control the Army's Software Defined Radio (SDR) communication networks. JENM configures numerous SDR radios such as the Manpack and Rifleman, enabling them to utilize the Mobile Ad Hoc Networking (MANET) waveforms such as the Soldier Radio Waveform (SRW), Wideband Networking Waveform (WNW), Mobile User Objective System (MUOS), Satellite Communications (SATCOM) Demand Assigned Multiple Access (DAMA), Integrated Waveform (IW), and Single Channel Ground and Airborne Radio System (SINCGARS) waveforms. Furthermore, JENM provides the Commander the ability to quickly reconfigure critical networks using its' Over the Air Management (OTAM) functionality. JENM enhances the S6's ability to conduct Course of Action (COA) Analysis and the Military Decision Making Process (MDMP) providing commanders critical information regarding their ability to effectively communicate.

In accordance with the JTNC ADM and Charter dated 20 January 2014, the JTN active efforts include the SRW, the WNW and the JENM.

FY 2019 Base RDTE dollars supports the continued development of the JENM software, testing support, and the program management office.

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

	FY 2017	FY 2018	FY 2019
Title: JENM Program Office Support	1.551	1.534	1.596
Description: Program Management Office support in the development of the JENM system.			
FY 2018 Plans:			
Program Office funding will support JENM design, engineering, integration and test of mid and lower tier planning and management application for the Software Defined Radio (SDR) network. To align with the emerging Integrated Network Operations (INO) vision, JENM will lower and mid-tier Network Management with that of WIN-T to enable Soldiers the ability to manage the entire, consolidated, tactical network. JENM will also work to extend our Over-The-Air-Management (OTAM)			

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EF5 / <i>Joint Tactical Network (JTN)</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
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capabilities to the mounted environment through our participation with Dynamic Network Connectivity development. Program Office Support funding will also support US Navy Digital Modular Radio (DMR) enhancements, ARC 210/231 development, USMC and USAF 117G MUOS deployment, full-rate production HMS Radios, AMF airborne radio, and the integration of USMC terrestrial based waveform planning and management capability. JENM will also manage the completion of deferred program requirements.

FY 2019 Plans:
 Program Office funding will support JENM design, engineering, integration and test of mid and lower tier planning and management application for the Software Defined Radio (SDR) network. To align with the Unified Network Operations (UNO) vision, JENM will lower and mid-tier Network Management with that of PM TN to enable Soldiers the ability to manage the entire, consolidated, tactical network. JENM will also work to extend our Over-The-Air-Management (OTAM) capabilities to the mounted/ tablet based environment through our participation with Dynamic Network Connectivity development. Program Office Support funding will also support completion of MUOS support for US Navy Digital Modular Radio (DMR) enhancements, ARC 210/231, USMC and USAF 117G MUOS, as well as full threshold requirement support for HMS Manpack and Leader Radios. Begin development in support of the AMF airborne radio, and the integration of USMC terrestrial based waveform planning and management capability. JENM will also manage the completion of deferred Army program requirements.

FY 2018 to FY 2019 Increase/Decrease Statement:
 Program Office Support costs slightly up in FY19 to support completion of deferred requirements.

Title: JENM Development	8.125	9.946	8.984
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Description: JENM provides consolidated communications planning, network configuration, network activation, position reporting, fault management, security management, and network health and status reporting needed to establish and maintain a mobile wireless network comprised of JTN network waveforms. JENM can interface with other external network managers, mission planning systems, network planning systems, key management systems, and spectrum planning systems. JENM is considered a mission essential system. JENM is also considered a critical element within the J-TNT configuration management tool kit.

FY 2018 Plans:
 JENM will support systems design, engineering, and integration of mid and lower tier radio planning and management application for the SDR network. JENM will provide support to the Unit Task Reorganization (UTR) systems integration effort to enable the S-6 to quickly transform the tactical network based upon the Commander's intent and associated mission analysis. JENM will support US Navy Digital Modular Radio (DMR) enhancements, ARC 210/231 development, full-rate production HMS Radios, Aviation Small Tactical Terminal (STT), and Small Airborne Networking Radio (SANR) and the integration of USMC terrestrial based waveform planning and management capability. JENM will continue to support modifications to the SRW, WNW, SINGARS, SATCOM, and Integrated Waveforms. JENM will also incorporate enhanced over the air management (OTAM)

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EF5 / <i>Joint Tactical Network (JTN)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
capabilities for U.S. Army mid and lower tier waveforms along with continued integration of JENM capability within the WIN-T Network Management System (NMS) including automating critical interface for planning and configuring crypto solutions. FY 2019 Plans: JENM will support systems design, engineering, and integration of mid and lower tier radio planning and management application for the SDR network. JENM will provide support to the Unit Task Reorganization (UTR) systems integration effort to enable the S-6 to quickly transform the tactical network based upon the Commander's intent and associated mission analysis. JENM will also work to extend our Over-The-Air-Management (OTAM) capabilities to the mounted/ tablet based environment through our participation with Dynamic Network Connectivity development. JENM will support completion of MUOS support for US Navy Digital Modular Radio (DMR) enhancements, ARC 210/231, USMC and USAF 117G MUOS, as well as full threshold requirement support for HMS Manpack and Leader Radios. Begin development in support of the AMF airborne radio, and the integration of USMC terrestrial based waveform planning and management capability. JENM will continue to support modifications to the SRW, WNW, MUOS, SINCGARS, SATCOM, and Integrated Waveforms. JENM will also manage the completion of deferred program requirements. FY 2018 to FY 2019 Increase/Decrease Statement: FY19 development costs decreased due to development level of effort tasks consistent with tactical radio requirements.				
Title: Test and Evaluation Description: Test and Evaluation of JENM FY 2018 Plans: JENM will provide direct support to the FY18 Developmental and Operational Test (DT/OT) of the PdM HMS Full and Open Competition (FOC) for the next generation HMS Manpack radio. JENM will execute a Functional Qualification Test (FQT) / Developmental Test (DT) and applicable cyber security testing leading into the planned Network Integration Exercise (NIE) 18.2 event, of which JENM will also undergo an Operational Test (OT) assessment to ensure it continues to meet the needs of today's Soldiers. FY 2019 Plans: JENM will provide direct support to the FY19 Developmental and Operational Test (DT/OT) of the PdM HMS Leader radio. JENM will undergo an Operational Test (OT) assessment to ensure it continues to meet the needs of today's Soldiers. JENM will also support the planned MUOS OT in FY19. FY 2018 to FY 2019 Increase/Decrease Statement: Schedule updates for the Rifleman/Leader radio test requirements have resulted in decreased JENM test requirements for FY19		-	2.730	0.576
Accomplishments/Planned Programs Subtotals		9.676	14.210	11.156

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EF5 / <i>Joint Tactical Network (JTN)</i>
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 0605031N: <i>0605031N; JTN, RDTE,N</i>	-	2.800	2.617	-	2.617	2.677	2.705	1.747	-	Continuing	Continuing
• 0605031F: <i>0605031F; JTNC, RDTE,F</i>	6.427	4.691	3.735	-	3.735	3.798	3.844	3.910	3.979	Continuing	Continuing

Remarks

PE 0605031A contains only the JTN (PdM Waveforms and PdM TCNO (JENM)) RDTE funding.

In accordance with the Acquisition Decision Memorandum (ADM) dated 11 July 2012, the Joint Tactical Radio System (JTRS) Program of Records (PORs) transitioned to Military Department (MILDEP) managed programs. As per the ADM dated 20 January 2014, JTN and JTNC became separate entities. FY 2015 and out, Army PE 0605031 contains only the JTN RDT&E funding. For FY2018 and out, the continuing JTN efforts are funded in Army PE 0605031A (JTN), Navy PE 0605031N (shared), Air Force PE 0605031F (shared) and USMC (Marine Corps Communications Systems - MCPC: 112107). As part of the joint program budget strategy, the Air Force and Army budget for approximately one-third each of the total program funds for JENM efforts. The Navy and USMC funding combined equal the other third of the JENM program funding. Prior to the year of execution, Navy and Air Force funding is consolidated in the Army PE (0605031A) and software sustainment funds are realigned from RDT&E to O&M,A PE (4326750A) to support the joint program acquisition strategy. USMC funding will be provided on an annual basis via Military Interdepartmental Purchase Request (MIPR). USMC funding projections are as follows: FY18 - \$1.407M; FY19 - \$1.118M; FY20 - \$1.121M; FY21 - \$1.139M and FY22 - \$1.392M.

In FY 2017 and out Waveform funding is on the Army PE 0605031A, Project Code EX6. JENM funding is under Army PE 0605031A Project Code EF5.

D. Acquisition Strategy

Joint Tactical Network Center (JTNC) Acquisition Decision Memorandum (ADM) (July 2012) (JENM Supporting Role). Per the December 2014 Joint Tactical Network (JTN) Select Acquisition Report (SAR), JTN was 90% expended and changed to inactive. Defense Acquisition Management Information Retrieval (DAMIR) reflected the inactive status on 3 June 2015 JTN APB (13 October 2015) (JENM Supporting Role).

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EF5 / <i>Joint Tactical Network (JTN)</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
JENM Program Management Support	C/CPFF	G2 Software Systems : San Diego, CA	-	0.809	Nov 2016	0.636	Nov 2017	0.650	Nov 2018	-		0.650	0.000	2.095	-
JENM Program Management Support	C/CPIF	Pending Contract Award : Aberdeen, MD	-	0.348	Nov 2016	-		-		-		-	0.000	0.348	-
JENM Program Management Support	Allot	USAASC : Aberdeen, MD	-	0.116	Oct 2016	-		-		-		-	Continuing	Continuing	Continuing
JENM Program Management Support	MIPR	SSC PACIFIC : San Diego, CA	-	0.238	Oct 2016	0.898	Oct 2017	0.946	Oct 2018	-		0.946	0.000	2.082	-
Program Management Support	C/CPFF	Booz Allen Hamilton : San Diego, CA	0.673	-		-		-		-		-	0.000	0.673	0.673
Program Management	C/CPFF	G2 Software Systems : San Diego, CA	1.683	-		-		-		-		-	0.000	1.683	1.683
Subtotal			2.356	1.511		1.534		1.596		-		1.596	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
JENM NMRIL Development	C/CPFF	G2 Software Systems : San Diego, CA	-	0.992	Nov 2016	-		-		-		-	0.000	0.992	-
JENM NMRIL Development	C/CPFF	Pending Contract Award : Aberdeen, MD	-	0.875	Nov 2016	-		-		-		-	0.000	0.875	-
JENM NMRIL Development	MIPR	SSC PACIFIC : San Diego, CA	-	1.741	Oct 2016	9.946	Oct 2017	8.984	Oct 2018	-		8.984	Continuing	Continuing	Continuing
Post Formal Qualification Testing-JENM	C/CPIF	Boeing : Huntington Beach, CA	6.139	-		-		-		-		-	0.000	6.139	4.991
Post Formal Qualification Testing-WNW	C/CPIF	General Dynamics : Scottsdale, AZ	2.757	-		-		-		-		-	0.000	2.757	2.976

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EF5 / <i>Joint Tactical Network (JTN)</i>
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Post Formal Qualification Testing-SRW	C/CPIF	Harris : Rochester, NY	2.554	-		-		-		-		-	0.000	2.554	2.554
Software Communications Architecture (SCA) Compliance	MIPR	NSA : Fort Meade, MD	0.953	-		-		-		-		-	0.000	0.953	0.953
Post FQT/Software Support	MIPR	SSC PAC : San Diego, CA	7.478	-		-		-		-		-	0.000	7.478	7.604
Post FQT/Software Support	MIPR	CERDEC : APG, MD	0.611	-		-		-		-		-	0.000	0.611	0.611
Post FQT/Software Support	MIPR	SSC LANT : Charleston, SC	5.229	-		-		-		-		-	0.000	5.229	5.229
Post Formal Qualification Testing-MUOS	C/CPIF	Lockheed Martin Corp. : Sunnyvale, CA	0.660	-		-		-		-		-	0.000	0.660	0.660
Post Formal Qualification Testing-Link 16	C/CPIF	BAE : Wayne, NJ	0.332	-		-		-		-		-	0.000	0.332	0.332
Subtotal			26.713	3.608		9.946		8.984		-		8.984	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
JENM v3 Software Support	C/CPFF	G2 Software Systems : San Diego, CA	-	0.350	Nov 2016	-		-		-		-	0.000	0.350	-
JENM v3 Software Support	C/CPFF	Pending Contract Award : Aberdeen, MD	-	0.537	Nov 2016	-		-		-		-	Continuing	Continuing	Continuing
JENM v3 Software Support	MIPR	SSC PACIFIC : San Diego, CA	-	0.582	Oct 2016	-		-		-		-	Continuing	Continuing	Continuing
Development/Engineering/ Technical Support	C/CPFF	Various : various	1.855	0.343		-		-		-		-	0.000	2.198	1.985
Subtotal			1.855	1.812		-		-		-		-	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / Joint Tactical Network (JTN)	Project (Number/Name) EF5 / Joint Tactical Network (JTN)
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
JENM v3 System Engineering and Test	MIPR	SSC PACIFIC : San Diego, CA	-	1.104	Oct 2016	1.193	Oct 2017	0.013	Oct 2018	-		0.013	Continuing	Continuing	Continuing
JENM v3 System Engineering and Test	MIPR	NM RIL : San Diego, CA	-	1.641	Nov 2016	1.537	Nov 2017	0.563	Oct 2018	-		0.563	0.000	3.741	-
JTN Test and Evaluation Support	C/CPFF	Booz Allen Hamilton : San Diego, CA	1.862	-		-		-		-		-	0.000	1.862	1.406
JTN Test and Evaluation	FFRDC	MITRE : San Diego, CA	3.661	-		-		-		-		-	0.000	3.661	3.205
JTN Test and Evaluation Support	C/CPFF	G2 Software Systems : San Diego, CA	1.648	-		-		-		-		-	0.000	1.648	1.192
Subtotal			7.171	2.745		2.730		0.576		-		0.576	Continuing	Continuing	N/A
Project Cost Totals			38.095	9.676		14.210		11.156		-		11.156	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EF5 / <i>Joint Tactical Network (JTN)</i>
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Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
FY2018 JENM Software Development and Release	[Redacted]				[Redacted]																							
JENM FQT FY18					 JENM FQT FY18																							
FY2020 JENM Software Development and Release					[Redacted]																							
JENM FQT FY20									 JENM FQT FY20																			
FY2022 JENM Software Development and Release													[Redacted]															
JENM FQT FY22																					 JENM FQT FY22							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EF5 / <i>Joint Tactical Network (JTN)</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
FY2018 JENM Software Development and Release	2	2017	2	2018
JENM FQT FY18	2	2018	2	2018
FY2020 JENM Software Development and Release	2	2018	1	2020
JENM FQT FY20	2	2020	2	2020
FY2022 JENM Software Development and Release	1	2020	1	2022
JENM FQT FY22	1	2023	1	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>				Project (Number/Name) EX6 / <i>Waveforms</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EX6: <i>Waveforms</i>	-	6.754	29.940	30.816	-	30.816	25.488	23.196	25.125	21.248	0.000	162.567
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

PdM Waveforms delivers, maintains, and upgrades portable, interoperable, mobile ad hoc networking waveforms and network enterprise services to enhance tactical warfighting capabilities. PdM Waveforms provides the Lower Tactical Internet with a suite of waveforms and network services that are: (1) Interoperable - used by all Services; (2) Capable of operating on a variety of hardware platforms, both Program of Record and non-developmental commercial radios; (3) Secure - meet all Department of Defense and US Government information assurance requirements; (4) Operationally relevant - quickly and effectively meet evolving network mission requirements of Combatant Commanders and the Services; and (5) Affordable - drive down procurement and support costs via a robust, competitive market which adheres to open government standards.

PdM Waveforms will remain agile to accommodate emerging warfighter needs by refocusing effort strategies to address the following:

- Engage industry to assess options for Low Probability of Interception/Low Probability of Detection (LPI/LPD) waveforms to reduce the signature of the tactical network
- Pursue alternative waveforms to reduce the complexity of MANET waveforms
- Improve spectral efficiency
- Seek Electronic Counter-Counter Measure (ECCM) improvements for operations in contested environment
- Implement improvements that allow the tactical radios to be operated in a radio silence mode.

FY 2019 Base RDTE dollars in the amount of \$30.816 million supports the continued development of the waveforms, testing support, and the program management office.

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

	FY 2017	FY 2018	FY 2019
Title: Program Management Office Support	0.793	3.772	3.383
Description: Provides Program Management Office (PMO) support for Waveforms enhancements.			
As a result of the Waveforms strategy moving forward, Waveforms will not be participating in the RMD process and will not utilize O&M funding aside from Core labor costs.			
For FY18, PMO costs include Core, Matrix, and SETA Contract labor. For FY19, PMO costs include Matrix and SETA Contract Labor only, as Core labor will be paid out of O&M funds.			
FY 2018 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EX6 / <i>Waveforms</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Continue program management support for PdM Waveforms. FY 2019 Plans: Continue program management support for PdM Waveforms. FY 2018 to FY 2019 Increase/Decrease Statement: Funding Decrease - staff reduction due to reorganization				
Title: Wideband Networking Waveform (WNW) Development Description: WNW is a high data rate Mobile Adhoc Networking (MANET) waveform application that provides the Army's mid-tier tactical Internet backbone (transit network) and connects tactical forces during Unified Land Operations, particularly in Denied, Degraded, Disrupted, Space Operational Environment (D3SOE). WNW provides high throughput, dynamically adaptable connectivity for the secure exchange of IP based voice, data, and video traffic. WNW has two signals-in-space (SiS), which are the Orthogonal Frequency Division Multiplexing (OFDM) and Anti-Jam (AJ), each with multiple bandwidths. WNW supports network nodes on mobile, airborne, and maritime platforms. WNW includes Type 1 Encryption, networking services, High Assurance IP Equipment (HAPE) capabilities, red/black switching, and internal routing of other WNW signals. WNW is currently ported on 7 radio platforms with 5 different vendors.		2.422	-	-
Title: Soldier Radio Waveform (SRW) Description: Soldier Radio Waveform (SRW) will operate on tactical radio sets to provide a networked battlefield communications capability for users engaged in land combat operations and will support voice, data, and video communications on the immediate battlefield. These forces include vehicles, rotary wing aircraft, dismounted Soldiers, and unmanned aerial vehicles (UAV). Functional software applications will use SRW radio enabled sets over Internet Protocol (IP) capable networks and sub-networks. SRW will be interoperable with higher throughput, IP based network waveforms, such as Wideband Networking Waveform (WNW). As applicable, these IP-based networking waveforms will enable information exchanges through the Global Information Grid (GIG) to the Soldier and provide entirely new capabilities for battlefield communications and information sharing. SRW is currently ported on 21 different radio platforms with 9 different vendors.		2.531	-	-
Title: Waveforms Software Development Description: Software Development efforts within PdM Waveforms are focused on the following: 1. Cyber Electro-magnetic Activities (CEMA) CEMA activities focus on impact the adversary's ability to communicate through voice and data communications. This also includes protecting and hardening Army capabilities and systems to prevent the adversary from doing the same. CEMA is not limited to voice and data communications, but also includes tactics such as deception and adversary communication extraction. CEMA consist of:		1.008	20.986	22.266

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EX6 / <i>Waveforms</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<ul style="list-style-type: none"> - Cyberspace and Cybersecurity Operations * Focused on IP traffic (data) * Intrusion Detection and Intrusion Prevention of Army networks within Tactical Radio platforms (HMS, AMF, MNVR) - Electronic Warfare (EW) * Focused on Radio Frequency (RF/voice) * Electronic Attack (EA) * Electronic Protection (EP) * Includes Anti-jam protection and deployment - Spectrum Management Operations (SMO). * Development of capabilities for the warfighter to maintain communication in spectrum denied environments. <p>2. SINGARS Development of a Frequency Hopping (FH3) mode, which will address the adversary's EA capabilities. Development of transmission security protocols.</p> <p>3. SRW & SRW Narrowband Integration Development of SRW Narrowband and the integration of Narrowband Code into the SRW baseline support the following warfighter capability gaps:</p> <ul style="list-style-type: none"> - Availability of adequate spectrum to deploy a full Brigade Combat Team of subnets is increasingly becoming a problem in combat environments. - Maintaining longer distances between communication nodes - Maintaining communication capabilities in foliage-heavy environments. - Operation in VHF and UHF bands with narrower bandwidths. <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Transition SINGARS Reference Implementation Laboratory (RIL) to CERDEC Ultra Lab - Complete trade studies addressing CEMA threats - Mitigate CEMA threats - Mitigate interference affects & coordinated EW and communications threats - Develop EW Enabled cyber capabilities <p>FY 2019 Plans:</p> <ul style="list-style-type: none"> - Mitigate CEMA threats 			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EX6 / <i>Waveforms</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<ul style="list-style-type: none"> - Mitigate interference affects & coordinated EW and communications threats - Develop EW Enabled cyber capabilities <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase due to SRW Narrowband requirements</p> <p>Title: Waveforms Software Support & Syatems Engineering</p> <p>Description: Beginning in FY18, due to a refocused product strategy, Waveforms will eliminate annual engineering releases and efforts will no longer be categorized and organized by product. Future work will be separated into Systems Engineering, Software Development, and Test and Evaluation categories.</p> <p>PdM Waveforms software support and systems engineering for waveforms and network manager applications provide the following:</p> <ul style="list-style-type: none"> - Identification and documentation of development requirements to meet warfighter capability gaps. - Documentation of code development. - Provides current status of open defects and necessary code baseline fixes by severity. - Maintain an integrated master schedule (IMS), including significant reviews, events, and required product delivery dates. - Risk Management execution through the Risk Review Board (RRB) <ul style="list-style-type: none"> * Risk identification and assessment * Risk mitigation planning and execution * Risk documentation - Configuration Management of waveform product baselines and changes via the Engineering Review Board (ERB) and two Configuration Control Board (CCBs). - Technical interface to pertinent stakeholders across PM TR and PEO C3T. - Provide necessary assistance and oversight to Waveforms product specific engineering. <p>FY 2018 Plans: Continue software support and systems engineering efforts as described above in support of PdM Waveforms.</p> <p>FY 2019 Plans: Continue software support and systems engineering efforts as described above in support of PdM Waveforms.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Decrease due to reduction in Software support.</p>		-	2.691	2.524
<p>Title: Waveforms Testing & Evaluation</p> <p>Description: Waveforms Testing and Evaluation insures the following:</p>		-	2.491	2.643

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EX6 / <i>Waveforms</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<ul style="list-style-type: none"> - compatibility with current components - integrations with appropriate subsystems - validation of waveform performance - compliance with current security verification requirements * NSA and JTeL IA certifications - compliance with current military standard documentation - interoperability with joint systems <p>FY 2018 Plans: Continue testing and evaluation procedures for waveforms code development and defect fixes to insure tactical waveforms meet warfighter requirements.</p> <p>FY 2019 Plans: Continue testing and evaluation procedures for waveforms code development and defect fixes to insure tactical waveforms meet warfighter requirements.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase due to additional waveform testing requirements.</p>			
Accomplishments/Planned Programs Subtotals	6.754	29.940	30.816

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• 4326750A: 4326750A: <i>JTN, O&M, A</i>	10.278	-	0.000	-	0.000	-	-	-	-	0.000	10.278

Remarks
For FY 2017 and prior, PdM Waveforms utilized OMA funding to support annual maintenance releases. Beginning in FY 2018, PdM Waveforms' refocused strategy assumes major upgrades to accommodate emerging warfighter needs. This strategy will eliminate the need for OMA funding. Therefore, RDTE funding increases.

D. Acquisition Strategy
PdM Waveforms is responsible for common core activities including developing and updating legacy and networking waveforms that operate on multiple radios sets and in all operational environments that support network-centric operational warfare. Waveform developments (upgrading, developing, and maintaining) will generally be procured through full and open contract competitions.

Beginning in FY 2018, based on the results of the FY 2017 Army Network Analysis, PdM Waveforms will refocus efforts to improve waveforms for lower and mid-tier networks. The effort will focus on development to achieve improved performance, network simplification, improved spectrum efficiency and improved EW/Cyber

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army Date: February 2018

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
2040 / 5	PE 0605031A / <i>Joint Tactical Network (JTN)</i>	EX6 / <i>Waveforms</i>

resistance. The planned waveforms may include changes to a mid-tier waveform, SRW 2.0/Narrow Band, and SINCGARS upgrades. This new capability must be completed by FY 2020-2021 to support future tactical radio procurements.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EX6 / <i>Waveforms</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support - CORE	MIPR	CORE : APG, MD	-	-		0.455		-		-		-	0.000	0.455	-
Program Management Support - Matrix	MIPR	CERDEC : APG, MD	-	0.232		0.529		0.539	Jan 2019	-		0.539	Continuing	Continuing	Continuing
Program Management Support - MITRE	MIPR	MITRE : Aberdeen, MD	-	0.561		-		-		-		-	0.000	0.561	-
Program Management Support - SETA	MIPR	Booz Allen Hamilton : Riverside, MD	-	-		2.788		2.513	Jun 2019	-		2.513	Continuing	Continuing	Continuing
Subtotal			-	0.793		3.772		3.052		-		3.052	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Software Development-SRW	C/CPFF	Harris : Rochester, NY	-	0.997		-		-		-		-	0.000	0.997	-
Software Development-SRW	C/CPFF	Various/TBD : APG, MD	-	0.920		-		-		-		-	0.000	0.920	-
Software Development - WNW	MIPR	SSC Atlantic : Charleston, SC	-	0.567		-		-		-		-	0.000	0.567	-
Software Development - CERDEC	MIPR	CERDEC : APG, MD	-	1.008		6.116		6.489		-		6.489	Continuing	Continuing	Continuing
Software Development - Technical/Coding (MA-IDIQ)	C/CPAF	MA - IDIQ : Various Locations	-	-		13.618		14.449		-		14.449	Continuing	Continuing	Continuing
Software Development - SSC LANT	MIPR	SSC LANT : Charleston, SC	-	-		1.253		1.329		-		1.329	Continuing	Continuing	Continuing
Subtotal			-	3.492		20.987		22.267		-		22.267	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EX6 / <i>Waveforms</i>
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Software Support - SRW	MIPR	CERDEC : APG, MD	-	0.194		-		-		-		-	0.000	0.194	-
Software Support - SRW	C/CPFF	Harris : Rochester, NY	-	0.306		-		-		-		-	0.000	0.306	-
Software Support - WNW	MIPR	SSC LANT : Charleston, SC	-	0.614		-		-		-		-	0.000	0.614	-
Software Support - WNW	C/CPFF	Various/TBD : APG, MD	-	0.862		-		-		-		-	0.000	0.862	-
Systems Engineering - MITRE	MIPR	MITRE : APG, MD	-	-		1.212		1.286		-		1.286	Continuing	Continuing	Continuing
Systems Engineering - SSC LANT	MIPR	SSC LANT : Charleston, SC	-	-		1.479		1.569		-		1.569	Continuing	Continuing	Continuing
Subtotal			-	1.976		2.691		2.855		-		2.855	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support (SRW RIL)	MIPR	CERDEC : APG, MD	-	0.146		-		-		-		-	0.000	0.146	-
Test and Evaluation Support (WNW RIL)	MIPR	SSC Atlantic : Charleston, SC	-	0.347		-		-		-		-	0.000	0.347	-
Test and Evaluation - CERDEC	MIPR	CERDEC : APG, MD	-	-		2.052		2.177		-		2.177	Continuing	Continuing	Continuing
Test and Evaluation - SSC LANT	MIPR	SSC LANT : Charleston, SC	-	-		0.438		0.465		-		0.465	Continuing	Continuing	Continuing
Subtotal			-	0.493		2.490		2.642		-		2.642	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		-	6.754	29.940	30.816	-	30.816	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EX6 / <i>Waveforms</i>
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Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Trade Studies Begin					▲ 1 Trade Studies Begin																							
Trade Studies					■ Trade Studies																							
MA - IDIQ RFP Release					▲ 2 MA - IDIQ RFP Release																							
Trade Studies Complete					▲ 3 Trade Studies Complete																							
MA - IDIQ Award					▲ 4 MA - IDIQ Award																							
Soldier Radio Waveform Narrowband Transition					▲ 5 SRW NB Transition (From S&TCD)																							
Soldier Radio Waveform 2.0					▲ 6 SRW 2.0 Release																							
Future Waveform Delivery	▲ 7 Future Waveform Delivery																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / <i>Joint Tactical Network (JTN)</i>	Project (Number/Name) EX6 / <i>Waveforms</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Trade Studies Begin	4	2017	4	2017
Trade Studies	4	2017	2	2018
MA - IDIQ RFP Release	4	2017	4	2017
Trade Studies Complete	2	2018	2	2018
MA - IDIQ Award	3	2018	3	2018
Soldier Radio Waveform Narrowband Transition	1	2019	1	2019
Soldier Radio Waveform 2.0	4	2020	4	2020
Future Waveform Delivery	4	2020	4	2020

Note

Due to MNVR AoA and changing requirements regarding the Army Tactical Network, PdM Waveforms has eliminated annual engineering software releases into the IR.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605032A / <i>TRACTOR TIRE</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	27.254	39.670	41.166	66.760	107.926	47.299	47.457	68.142	68.435	0.000	406.183
ET3: <i>Tractor Trick</i>	-	27.254	39.670	41.166	66.760	107.926	47.299	47.457	68.142	68.435	0.000	406.183

Note

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

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 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	27.254	39.670	35.795	-	35.795
Current President's Budget	27.254	39.670	41.166	66.760	107.926
Total Adjustments	0.000	0.000	5.371	66.760	72.131
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	5.371	66.760	72.131

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: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0605033A / Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	4.838	5.207	5.175	-	5.175	6.794	0.000	0.000	0.000	0.000	22.014
EQ3: Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)	-	4.838	5.207	5.175	-	5.175	6.794	0.000	0.000	0.000	0.000	22.014

Note

Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) was funded in Integrated Base Defense (IBD) Program Element: 0205402A EF2 in FY2016.

A. Mission Description and Budget Item Justification

Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) will replace the interim Persistent Surveillance System-Ground (PSS-G) Increment 1 towers with improved persistent surveillance capabilities and will provide network integration and better mobility utilizing modular configurations. GBOSS-E will replace obsolete, quick reaction capability (QRC) surveillance and force protections systems utilizing modular configurations: Light variant (man transportable/detachable) for extra small base camps or small outpost/company, Medium variant (mid sensor height) for small to medium size base, and Heavy variant (high level sensor height) for large contingency base camps. GBOSS-E will operate in a stand-alone mode or as part of an integrated network utilizing government owned software, be easily operated and maintained, and be rugged enough to support employment in expeditionary operations worldwide.

B. Program Change Summary (\$ in Millions)

	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	5.032	5.207	3.529	-	3.529
Current President's Budget	4.838	5.207	5.175	-	5.175
Total Adjustments	-0.194	0.000	1.646	-	1.646
• Congressional General Reductions	-0.002	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.192	-			
• Adjustments to Budget Years	-	-	1.646	-	1.646

Change Summary Explanation

FY 2019 increase of \$1.646 million is due to an adjustment required to align funding with planned acquisition strategy.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605033A / <i>Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)</i>				Project (Number/Name) EQ3 / <i>Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EQ3: <i>Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)</i>	-	4.838	5.207	5.175	-	5.175	6.794	0.000	0.000	0.000	0.000	22.014
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) was funded in Integrated Base Defense Program Element: 0205402A EF2 in FY 2016.

A. Mission Description and Budget Item Justification

Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) will replace the interim Persistent Surveillance System-Ground (PSS-G) Increment 1 towers with improved persistent surveillance capabilities and will provide network integration and better mobility utilizing modular configurations. GBOSS-E will replace obsolete, quick reaction capability (QRC) surveillance and force protections systems utilizing modular configurations: Light variant (man transportable/detachable) for extra small base camps or small outpost/company, Medium variant (mid sensor height) for small to medium size base, and Heavy variant (high level sensor height) for large contingency base camps. GBOSS-E will operate in a stand-alone mode or as part of an integrated network utilizing government owned software, be easily operated and maintained, and be rugged enough to support employment in expeditionary operations worldwide.

FY 2019 Base Funding in the amount of \$5.175 million supports the continued development efforts for GBOSS-E to include the Technical Data Package (TDP) and Product Support Analysis for all system configurations and participation in Technical Support Operational Analysis (TSOA) events that will provide user feedback and capability assessments. This funding also supports acquisition of Engineering Development Models for the following components, Heavy Tower Trailer, Electro Optic Infrared (EOIR) sensor, and Radio Frequency (RF) Sensor. In addition, funding supports technical testing, Developmental Testing, Limited User Testing (LUT) and program management activities.

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

	FY 2017	FY 2018	FY 2019
Title: GBOSS-E Design and Build	4.838	5.207	5.175
Description: GBOSS-E completes building of Prototype/Engineering Development Models (EDMs) and starts Development Testing (DT).			
FY 2018 Plans: Funding supports continued development of Engineering Development Models, integration testing, and program management activities.			
FY 2019 Plans: FY 2019 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605033A / <i>Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)</i>	Project (Number/Name) EQ3 / <i>Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Funding supports completion of the Engineering Development Models, technical testing of the chosen components, Integration activities, Developmental Testing, Limited User Testing (LUT), Logistics demonstration and program management activities			
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> FY 2018 to FY 2019 Increase/Decrease Statement: Change in funding level from FY 2018 to FY 2019 is due to an adjustment of the planned acquisition milestones. Developmental activities originally planned in FY18 will now cross fiscal years with additional support required for integrated testing events realigned to FY19. (Note: Program Management Office (PMO) support funds realigned from RDT&E to Operations and Maintenance Army (OMA).			
Accomplishments/Planned Programs Subtotals	4.838	5.207	5.175

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• M90212: <i>G-BOSS(E) (M90212)</i>	26.572	-	0.000	-	0.000	-	-	-	-	Continuing	Continuing

Remarks

D. Acquisition Strategy

Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E) will replace the interim Persistent Surveillance System - Ground (PSS-G) Increment 1 towers with improved persistent surveillance capabilities along with network integration and better mobility utilizing modular configurations. The GBOSS-E Capability Design Document (CDD) was AROC approved May 2014. In FY 2013, FY 2014 & FY 2015, the Department of Defense (DoD) Physical Security Enterprise and Analysis Group (PSEAG) provided funds to conduct pre-milestone B activities.

GBOSS-E received an approved Materiel Development Decision (MDD) from the Milestone Decision Authority (MDA) on 4 December 2015. Milestone B decision accomplished 29 Sep 2017, the existing United States Marine Corps (USMC) tower's design (Ground Based Operational Surveillance System) (GBOSS) will be leveraged and modified to meet the Army's GBOSS-E program requirements.

The acquisition strategy for GBOSS-E was approved by the Milestone Decision Authority (MDA) on 11 December 2016, which approved plans to leverage the Naval Surface Warfare Center (NSWC) at Crane, Indiana and the Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, Virginia to provide system design, development, and integration support, as well as a Technical Data Package (TDP) to support future procurements. The Heavy Tower Trailer, EO/IR, and RF Sensor which are the main cost drivers for the system will be competitively awarded through the product office and provided to a prime integrator with the TDP to construct future GBOSS-E systems.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605033A / <i>Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)</i>	Project (Number/Name) EQ3 / <i>Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)</i>

Milestone C is planned for FY 2020 and will align GBOSS-E, IGSSR-C, and Tactical Security System (TSS) in order to gain programmatic efficiencies.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605033A / <i>Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)</i>	Project (Number/Name) EQ3 / <i>Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)</i>
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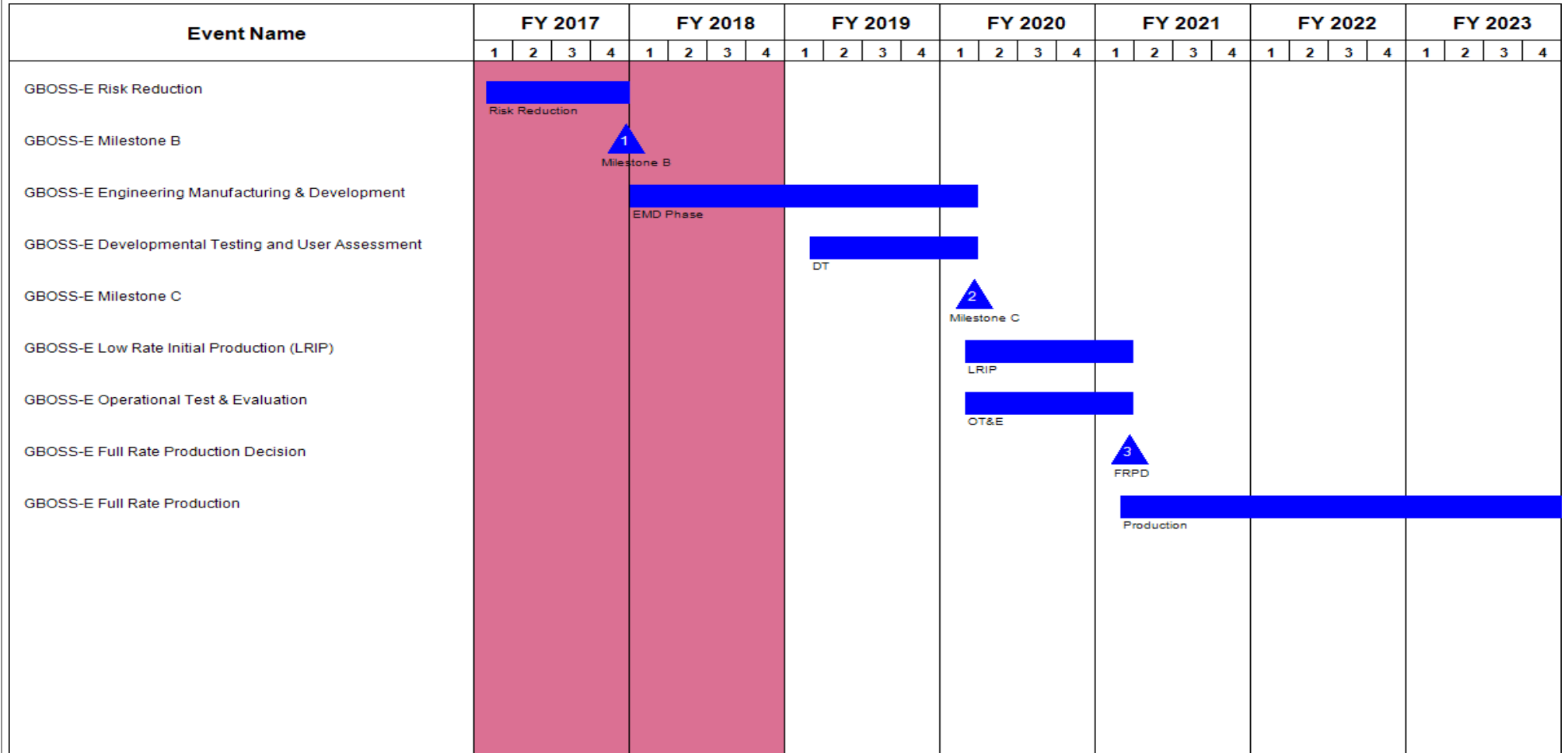
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
GBOSS-E Project Management	MIPR	PM FPS : Fort Belvoir, VA	-	1.112	Dec 2016	0.365		-		-		-	0.000	1.477	-
Subtotal			-	1.112		0.365		-		-		-	0.000	1.477	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
GBOSS-E Design Engineering	MIPR	NSWC Crane : Crane, IN	-	1.933	Dec 2016	0.821		2.049	Feb 2019	-		2.049	Continuing	Continuing	Continuing
GBOSS-E Software Development	TBD	TBD : TBD	-	0.263	Dec 2016	0.504		0.520	Feb 2019	-		0.520	Continuing	Continuing	Continuing
GBOSS-E Integration Support	MIPR	NSWC Crane : Crane, IN	-	1.125		1.203		0.664	Oct 2018	-		0.664	Continuing	Continuing	Continuing
Tech Data	MIPR	NSWC Crane : Crane, IN	-	-		0.687		0.866	Feb 2019	-		0.866	Continuing	Continuing	Continuing
Subtotal			-	3.321		3.215		4.099		-		4.099	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
GBOSS-E Design Support	MIPR	RDECOM CERDEC : Fort Belvoir, VA	-	0.310	Dec 2016	0.707		0.190	Jan 2019	-		0.190	Continuing	Continuing	Continuing
ARL Human Systems Integration Support	MIPR	US Army ARL : Adelphi, MD	-	0.025	Dec 2016	0.025		0.025	Jan 2019	-		0.025	Continuing	Continuing	Continuing
CECOM FSD - Safety	MIPR	CECOM : APG, MD	-	0.025	Dec 2016	0.050		0.016	Jan 2019	-		0.016	Continuing	Continuing	Continuing
Subtotal			-	0.360		0.782		0.231		-		0.231	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605033A / <i>Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)</i>	Project (Number/Name) EQ3 / <i>Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)</i>



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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605033A / <i>Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)</i>	Project (Number/Name) EQ3 / <i>Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
GBOSS-E Risk Reduction	1	2016	4	2017
GBOSS-E Milestone B	4	2017	4	2017
GBOSS-E Engineering Manufacturing & Development	1	2018	1	2020
GBOSS-E Developmental Testing and User Assessment	1	2019	1	2020
GBOSS-E Milestone C	1	2020	1	2020
GBOSS-E Low Rate Initial Production (LRIP)	1	2020	1	2021
GBOSS-E Operational Test & Evaluation	1	2020	1	2021
GBOSS-E Full Rate Production Decision	1	2021	1	2021
GBOSS-E Full Rate Production	1	2021	1	2025

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605034A / <i>Tactical Security System (TSS)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	2.792	4.727	4.496	-	4.496	6.400	2.946	0.545	0.000	0.000	21.906
EQ4: <i>Tactical Security System (TSS)</i>	-	2.792	4.727	4.496	-	4.496	6.400	2.946	0.545	0.000	0.000	21.906

A. Mission Description and Budget Item Justification

The Tactical Security System (TSS) is a modular, scalable, lightweight, rapidly deployable, ground based security and surveillance Family of Systems (FoS). The design of TSS allows for hasty emplacement and is tailorable to support short and long term security, surveillance and detection missions. The TSS and its components are designed to be employed as a stand-alone system, in a layered effort or integrated with additional force protection (FP) systems. Integration with additional sensors will be obtained through network communications and software in line with Net-Ready requirements. TSS will address four of the five base camp core protection/security capabilities identified in the Integrated Base Defense (IBD) Concept of Operations (CONOPS) which are perimeter security, entry control, persistent surveillance, warning and alerting. The TSS will be compliant with the Common Operating Environment (COE) Architecture and Implementation Plan. TSS is designed to be employed as a stand-alone system in a layered effort or integrated with additional force protection systems including motion, acoustic, seismic, surface, and detection technologies.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	2.904	4.727	3.957	-	3.957
Current President's Budget	2.792	4.727	4.496	-	4.496
Total Adjustments	-0.112	0.000	0.539	-	0.539
• Congressional General Reductions	-0.001	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.111	-			
• Adjustments to Budget Years	-	-	0.539	-	0.539

Change Summary Explanation

FY 2017 variation due to \$1K for FFRDC Reduction and \$111K for SBIR/STTR reduction.

 Increase to FY 2019 funding is due to an adjustment required to align funding with planned acquisition strategy.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605034A / <i>Tactical Security System (TSS)</i>				Project (Number/Name) EQ4 / <i>Tactical Security System (TSS)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EQ4: <i>Tactical Security System (TSS)</i>	-	2.792	4.727	4.496	-	4.496	6.400	2.946	0.545	0.000	0.000	21.906
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Tactical Security System (TSS) is a modular, scalable, lightweight, rapidly deployable, ground based security and surveillance Family of Systems (FoS). The design of TSS allows for hasty emplacement and is tailorable to support short and long term security, surveillance and detection missions. The TSS and its components are designed to be employed as a stand-alone system, in a layered effort or integrated with additional force protection (FP) systems. Integration with additional sensors will be obtained through network communications and software in line with Net-Ready requirements. TSS will address four of the five base camp core protection/security capabilities identified in the Integrated Base Defense (IBD) Concept of Operations (CONOPS) which are perimeter security, entry control, persistent surveillance, warning and alerting. The TSS will be compliant with the Common Operating Environment (COE) Architecture and Implementation Plan. TSS is designed to be employed as a stand-alone system in a layered effort or integrated with additional force protection systems including motion, acoustic, seismic, surface, and detection technologies.

FY 2019 Base Funding in the amount of \$4.544 million supports the system level Critical Design Review (CDR), continued development of the Technical Data Package (TDP) and Product Support Analysis, Developmental Testing and Limited User Testing (LUT).

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

	FY 2017	FY 2018	FY 2019
Title: TSS Design and Build	2.792	4.727	4.496
Description: TSS completes building of Engineering Development Model (EDM), integration with Integrated Ground Security Surveillance and Response Capability (IGSSR-C) and Common Operating Environment (COE), and Developmental Testing (DT) of prototype.			
FY 2018 Plans: TSS completes building of the Engineering Development Model (EDM), support Program Management Office (PMO), PDR and component selection integration testing of the EDM.			
FY 2019 Plans: TSS completes the Critical Design Review (CDR), continues Technical Data Package and Product Support Analysis and Package development, begins Developmental Testing and Limited User Testing (LUT), Logistics demonstration and supports Program Management Office (PMO).			
FY 2018 to FY 2019 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605034A / <i>Tactical Security System (TSS)</i>	Project (Number/Name) EQ4 / <i>Tactical Security System (TSS)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Additional funding provided to synchronize developmental testing activities to gain efficiencies between the PORs. (Note: Program Management Office (PMO) support funds realigned from RDT&E to Operations and Maintenance Army (OMA).				
Accomplishments/Planned Programs Subtotals		2.792	4.727	4.496
C. Other Program Funding Summary (\$ in Millions) N/A				
Remarks				
D. Acquisition Strategy Tactical Security System (TSS) will eliminate the Non-Standard Equipment (NSE) currently used in the Force Protection System (FPS) under the Base Expeditionary Targeting and Surveillance System - Combined (BETSS-C) Quick Reaction Capability (QRC) with improved surveillance capabilities in modular configurations along with enhanced network integration across the command and control system and Common Operating Environment (COE). In FY2016, the Department of Defense (DoD) Physical Security Enterprise and Analysis Group (PSEAG) provided funding to support pre-milestone B and risk reduction activities. TSS received Materiel Development Decision (MDD) approval on 6 January 2017. The acquisition concept and contracting strategy for TSS is pending approval from the Milestone Decision Authority (MDA) with plans to leverage an existing task order through Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, Virginia to provide engineering and developmental support for the TSS design, development, and integration of an Engineering Development Model (EDM) and to support Operational Assessments (OA). Key efforts include the development of the EDM, testing and evaluation for TSS Key Performance Parameters (KPPs)/Key System Attributes (KSAs)/Additional Performance Parameters (APAs), and Developmental and Operational Test and Evaluation (DOT&E). Milestone C is planned for FY 2020 to align Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E), Integrated Ground Security, Surveillance and Response Capability (IGSSR-C), and TSS in order to gain programmatic efficiencies.				
E. Performance Metrics N/A				

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605034A / <i>Tactical Security System (TSS)</i>	Project (Number/Name) EQ4 / <i>Tactical Security System (TSS)</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
TSS Project Management	MIPR	PM EOIR : Fort Belvoir, VA	-	0.020	Dec 2017	0.330		-		-		-	0.000	0.350	-
Subtotal			-	0.020		0.330		-		-		-	0.000	0.350	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
TSS Design	TBD	TBD : TBD	-	1.000	Dec 2017	1.033		3.077	Jan 2019	-		3.077	Continuing	Continuing	Continuing
TSS Prototypes	TBD	TBD : TBD	-	1.000	Dec 2017	1.195		-		-		-	0.000	2.195	-
TSS Software Development	TBD	TBD : TBD	-	0.772	Dec 2017	0.138		0.350	Dec 2018	-		0.350	Continuing	Continuing	Continuing
TSS Integration	TBD	TBD : TBD	-	-		0.977		0.135	Oct 2018	-		0.135	Continuing	Continuing	Continuing
Subtotal			-	2.772		3.343		3.562		-		3.562	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
TSS Design Support	MIPR	RDECOM CERDEC : Fort Belvoir, VA	-	-		0.729		0.379	Jan 2019	-		0.379	Continuing	Continuing	Continuing
ARL Human Systems Integration Support	MIPR	US Army ARL : Adelphi, MD	-	-		0.025		0.025	Jan 2019	-		0.025	Continuing	Continuing	Continuing
CECOM FSD - Safety	MIPR	CECOM : APG, MD	-	-		0.050		0.050	Nov 2018	-		0.050	Continuing	Continuing	Continuing
Subtotal			-	-		0.804		0.454		-		0.454	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605034A / <i>Tactical Security System (TSS)</i>	Project (Number/Name) EQ4 / <i>Tactical Security System (TSS)</i>
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
TSS Test and Evaluation	MIPR	ATEC : APG, MD	-	-		0.250		0.480	Mar 2019	-		0.480	Continuing	Continuing	Continuing
Subtotal			-	-		0.250		0.480		-		0.480	Continuing	Continuing	N/A
Project Cost Totals			-	2.792		4.727		4.496		-		4.496	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605034A / <i>Tactical Security System (TSS)</i>	Project (Number/Name) EQ4 / <i>Tactical Security System (TSS)</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
TSS Material Development Decision	▲ 1 MDD																											
TSS Pre Milestone B Activities / Risk Reduction	Pre-MS B/Risk Reduction																											
TSS Milestone B					▲ 2 Milestone B																							
TSS Engineering & Manufacturing Development									EMD Phase																			
TSS Development Testing/Operational Assessment									DT/OA																			
TSS Milestone C													▲ 3 Milestone C															
TSS Low Rate Initial Production (LRIP)													LRIP															
TSS Operational Test & Evaluation													OT&E															
TSS Full Rate Production Decision																	▲ 4 FRPDR											
TSS Full Rate Production																	Production											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605034A / <i>Tactical Security System (TSS)</i>	Project (Number/Name) EQ4 / <i>Tactical Security System (TSS)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
TSS Material Development Decision	2	2017	2	2017
TSS Pre Milestone B Activities / Risk Reduction	2	2016	4	2017
TSS Milestone B	3	2018	3	2018
TSS Engineering & Manufacturing Development	3	2018	1	2020
TSS Development Testing/Operational Assessment	1	2019	1	2020
TSS Milestone C	1	2020	1	2020
TSS Low Rate Initial Production (LRIP)	2	2020	1	2021
TSS Operational Test & Evaluation	2	2020	4	2020
TSS Full Rate Production Decision	1	2021	1	2021
TSS Full Rate Production	2	2021	4	2023

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	90.685	127.318	51.178	2.670	53.848	46.445	27.385	1.453	1.481	0.000	348.615
EB4: <i>CIRCM</i>	-	90.685	127.318	51.178	2.670	53.848	46.445	27.385	1.453	1.481	0.000	348.615

A. Mission Description and Budget Item Justification

The Common Infrared Countermeasure (CIRCM) budget line includes CIRCM (EB4), and funding to counter emerging technology as identified in Joint Urgent Operational Needs Statement (JUONS) SO-0010 Phase 2a and the Headquarters Department of the Army (HQDA) Directed Requirement for the Advanced Threat Warner Common Infrared Countermeasures Quick Reaction Capability (ATW & CIRCM QRC).

CIRCM (EB4)

The Common Infrared Countermeasure (CIRCM) is the next generation lightweight, laser-based Infrared Countermeasure (IRCM) component that will interface with both the Army's Common Missile Warning System (CMWS) and future missile warning systems (MWS) to defeat current and emerging missile threats that use multispectral technology for rotary-wing, tilt-rotor and small fixed-wing aircraft across the DoD. CIRCM receives an angular bearing hand-off from the MWS, employs a pointing and tracking system which acquires the handed-over threat and tracks the incoming missile during and after motor burnout. CIRCM jams the missile by using modulated laser energy in the missile seeker band, thus degrading the tracking capability of the missile and causing it to miss the aircraft. CIRCM is utilizing Open Systems Architecture which allows flexibility with software and hardware refreshes to keep pace with future threats.

The CIRCM A-Kit includes mounting hardware, wiring harnesses, and other components necessary to install and interface the mission kit on host aircraft. The A-Kit ensures the mission kit is functionally and physically operational with a specific host aircraft type. The CIRCM B-Kit is the mission kit (laser, pointer tracker, and controller) required to achieve near spherical coverage for an aircraft.

JUONS SO-0010 and ATW & CIRCM QRC

Phase 2a DoN LAIRCM (JUONS S0-0010) and Phase 3 ATW & CIRCM QRC: Initially, a select number of aircraft in the threat area of responsibility will be outfitted with the Phase 2a Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system. However, this approach came with a Space, Weight and Power - Cooling (SWaP-C) penalty which is being addressed as a follow-on JUONS solution requirement using the Phase 3 Advanced Threat Warner (ATW) and Common Infrared Countermeasure (CIRCM) Quick Reaction Capability (QRC). The intent of the Phase 3 ATW & CIRCM QRC effort is to reduce the SWaP-C associated with the Phase 2a solution.

FY 2019 Base Research, Development, Test, and Evaluation (RDT&E) funding in the amount of \$51.178 million funds continued A-Kit and B-Kit development, and post Milestone C planning and execution of Initial Operational Test and Evaluation (IOT&E).

FY 2019 RDT&E Overseas Contingency Operations (OCO) funding in the amount of \$2.670 million will support regression testing efforts related to the Phase 3 ATW & CIRCM QRC effort.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	107.877	127.318	52.410	-	52.410
Current President's Budget	90.685	127.318	51.178	2.670	53.848
Total Adjustments	-17.192	0.000	-1.232	2.670	1.438
• Congressional General Reductions	-14.000	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.152	-			
• Adjustments to Budget Years	-	-	-1.232	2.670	1.438
• FFRDC	-0.040	-	-	-	-

Change Summary Explanation

FY 2019 funding will support efforts related to the Phase 3 ATW & CIRCM QRC effort.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	Project (Number/Name) EB4 / <i>CIRCM</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EB4: <i>CIRCM</i>	-	90.685	127.318	51.178	2.670	53.848	46.445	27.385	1.453	1.481	0.000	348.615
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funds in the program are a realignment of funds from program VU8, PE 0604270A (Electronic Warfare Development) for more efficient and effective program management.

A. Mission Description and Budget Item Justification

The Common Infrared Countermeasure (CIRCM) budget line includes CIRCM (EB4), and funding to counter emerging technology as identified in Joint Urgent Operational Needs Statement (JUONS) SO-0010 Phase 2a and the Headquarters Department of the Army (HQDA) Directed Requirement for the Advanced Threat Warner Common Infrared Countermeasures Quick Reaction Capability (ATW & CIRCM QRC).

CIRCM (EB4)

The Common Infrared Countermeasure (CIRCM) is the next generation lightweight, laser-based Infrared Countermeasure (IRCM) component that will interface with both the Army's Common Missile Warning System (CMWS) and future missile warning systems (MWS) to defeat current and emerging missile threats that use multispectral technology for rotary-wing, tilt-rotor and small fixed-wing aircraft across the DoD. CIRCM receives an angular bearing hand-off from the MWS, employs a pointing and tracking system which acquires the handed-over threat and tracks the incoming missile during and after motor burnout. CIRCM jams the missile by using modulated laser energy in the missile seeker band, thus degrading the tracking capability of the missile and causing it to miss the aircraft. CIRCM is utilizing Open Systems Architecture which allows flexibility with software and hardware refreshes to keep pace with future threats.

The CIRCM A-Kit includes mounting hardware, wiring harnesses, and other components necessary to install and interface the mission kit on host aircraft. The A-Kit ensures the mission kit is functionally and physically operational with a specific host aircraft type. The CIRCM B-Kit is the mission kit (laser, pointer tracker, and controller) required to achieve near spherical coverage for an aircraft.

JUONS SO-0010 and ATW & CIRCM QRC

Phase 2a DoN LAIRCM (JUONS SO-0010) and Phase 3 ATW & CIRCM QRC: Initially, a select number of aircraft in the threat area of responsibility will be outfitted with the Phase 2a Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system. However, this approach came with a Space, Weight and Power - Cooling (SWaP-C) penalty which is being addressed as a follow-on JUONS solution requirement using the Phase 3 Advanced Threat Warner (ATW) and Common Infrared Countermeasure (CIRCM) Quick Reaction Capability (QRC). The intent of the Phase 3 ATW & CIRCM QRC effort is to reduce the SWaP-C associated with the Phase 2a solution.

FY 2019 Base Research, Development, Test, and Evaluation (RDT&E) funding in the amount of \$51.178 million funds continued A-Kit and B-Kit development, and post Milestone C planning and execution of IOT&E.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	Project (Number/Name) EB4 / <i>CIRCM</i>
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FY 2019 RDT&E Overseas Contingency Operations (OCO) funding in the amount of \$2.670 million will support regression testing efforts related to the Phase 3 ATW & CIRCM QRC effort.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: CIRCM Product Development</p> <p>Description: CIRCM Product Development, Support Costs, & Management Services</p> <p>FY 2018 Plans: RDT&E dollars support completion of EMD phase and start of the Production and Deployment phase, start of Low Rate Initial Production (LRIP) 1, and multi-platform A-Kit and B-Kit development and integration.</p> <p>FY 2019 Base Plans: RDT&E dollars support continued software and hardware development of A-Kits and B-Kits for the AH-64E, CH-47F, and MH-60M platforms.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 funding is decreased compared to FY 2018 funding because CIRCM will have achieved Milestone C, and will therefore require less RDT&E funding than in FY 2018.</p>	27.479	54.687	25.068	-	25.068
<p>Title: CIRCM Test & Evaluation (T&E)</p> <p>Description: CIRCM Test & Evaluation (T&E) Activities</p> <p>FY 2018 Plans: RDT&E dollars support completion of Reliability Demonstration Testing (RDT), and continue A-Kit and B-Kit testing to include developmental/operational T&E.</p> <p>FY 2019 Base Plans: RDT&E dollars support post Milestone C planning and execution of IOT&E, and continued efforts to develop IRCM solutions to defeat newly developed threats.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 funding is decreased compared to FY 2018 funding because CIRCM will have achieved Milestone C, and will therefore require less RDT&E funding than in FY 2018.</p>	52.306	51.091	26.110	-	26.110
<p>Title: Phase 3 ATW & CIRCM QRC OCO</p> <p>Description: Phase 3 ATW & CIRCM QRC Integration and Testing</p>	10.900	21.540	0.000	2.670	2.670

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	Project (Number/Name) EB4 / <i>CIRCM</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p><i>FY 2018 Plans:</i> RDT&E dollars will support the Army ATW Processor, B-Kit development, integration, and associated T&E efforts. This effort will integrate the ATW and CIRCM systems to reduce Space, Weight and Power - Cooling (SWaP-C) in support of Phase 3.</p> <p><i>FY 2019 Base Plans:</i> N/A</p> <p><i>FY 2019 OCO Plans:</i> FY 2019 RDT&E Overseas Contingency Operations (OCO) funding in the amount of \$2.670 million will support regression testing efforts related to the Phase 3 ATW & CIRCM QRC effort.</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> FY 2019 funding is decreased compared to FY 2018 funding because the majority of the required CIRCM related integration and testing for Phase 3 ATW & CIRCM QRC will have been completed by the end of FY 2018. FY19 funding will support regression testing for safety of flight.</p>					
Accomplishments/Planned Programs Subtotals	90.685	127.318	51.178	2.670	53.848

C. Other Program Funding Summary (\$ in Millions)										
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete
• AZ3537: SSN AZ3537; BA4; CIRCM	108.721	49.777	36.987	115.830	152.817	113.371	119.609	149.287	168.418	Continuing

Remarks
None

D. Acquisition Strategy
The December 28, 2011, Defense Acquisition Executive (DAE) Acquisition Decision Memorandum (ADM) authorized entry into the Technology Maturation and Risk Reduction (TMRR) phase, designated the program a pre-Major Defense Acquisition Program (MDAP), and approved the updated exit criteria. The August 25, 2015, DAE ADM authorized entry into the Engineering and Manufacturing Development (EMD) phase and designated the program as a MDAP. The EMD contract was awarded to Northrup Grumman Systems Corporation (NGSC) on August 28, 2015. The EMD contract includes priced options for Other Platform A-Kit Development, A-Kit Engineering Support, Low Rate Initial Production (LRIP) 1 and 2 Prototypes (Hardware and Installs), LRIP 1 and 2 Engineering and Test Support, Software Technical Data Package (TDP), Navy funded requirements, and Defense Exportability Features (DEF). Upon CIRCM MS C approval planned for the fourth quarter of FY18, the

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army Date: February 2018

Appropriation/Budget Activity	R-1 Program Element (Number/Name)	Project (Number/Name)
2040 / 5	PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	EB4 / <i>CIRCM</i>

LRIP and Engineering Support options may be exercised and the program may immediately enter the Production & Deployment phase with First Unit Equipped (FUE) planned for third quarter of FY20, and a Full Rate Production Decision Review (FRPDR) planned for the third quarter of FY20.

Due to the urgency of addressing the SWaP-C penalty issues related to the JUONS SO-0010 initial DoN LAIRCM material solution, the Army approved a Directed Requirement for the ATW and CIRCM systems, which will be a sole source QRC effort with Northrop Grumman. Northrop Grumman has the required technical capabilities, knowledge and special equipment needed to meet the urgent and compelling need for the ATW CIRCM QRC effort.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605035A / Common Infrared Countermeasures (CIRCM)				EB4 / CIRCM							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering Program Management	Various	Various : -	14.504	8.017		9.978		5.879	Oct 2018	0.267	Dec 2018	6.146	Continuing	Continuing	Continuing
ATW CIRCM QRC System Engineering & Program Management	Various	Various : -	-	1.100		2.154		-		-		-	Continuing	Continuing	Continuing
Subtotal			14.504	9.117		12.132		5.879		0.267		6.146	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Non-recurring Engineering (NRE)	C/CPFF	Various : -	45.906	11.007	Nov 2016	18.125		11.330	Jun 2019	-		11.330	Continuing	Continuing	Continuing
Prototype Manufacturing	C/FPIF	Various : -	25.334	-		11.892		-		-		-	Continuing	Continuing	Continuing
Development - System Integration Lab (SIL) Capability Improvements	Various	Various : -	-	-		2.000		-		-		-	Continuing	Continuing	Continuing
Other - Threat Management	Various	Various : -	15.659	8.017	Mar 2017	6.692		5.409	Mar 2019	-		5.409	Continuing	Continuing	Continuing
Data - Logistics Support	Various	Various : -	0.267	0.438	May 2017	1.000		-		-		-	Continuing	Continuing	Continuing
ATW CIRCM QRC NRE	C/CPFF	Various : -	-	3.280	Nov 2016	3.231		0.000		0.400	Dec 2018	0.400	Continuing	Continuing	Continuing
ATW CIRCM QRC Prototype Manufacturing	C/CPFF	Various : -	-	2.120	Nov 2016	-		-		-		-	Continuing	Continuing	Continuing
ATW CIRCM QRC A-Kit Development & Integration	Various	Various : -	22.390	-		5.385		0.000		0.668	Mar 2019	0.668	Continuing	Continuing	Continuing
Subtotal			109.556	24.862		48.325		16.739		1.068		17.807	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605035A / Common Infrared Countermeasures (CIRCM)				EB4 / CIRCM							
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Equipment	Various	Various : -	5.046	-		5.000		3.000	Feb 2019	-		3.000	Continuing	Continuing	Continuing
Subtotal			5.046	-		5.000		3.000		-		3.000	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government System Test and Evaluation	Various	Various : -	52.893	37.514	Apr 2017	42.417		13.379	Apr 2019	-		13.379	Continuing	Continuing	Continuing
Other Testing - Threat Assets	Various	Various : -	16.200	14.792	May 2017	8.674		12.181	May 2019	-		12.181	Continuing	Continuing	Continuing
ATW CIRCM QRC Government System Test & Evaluation	Various	Various : -	1.610	4.400	Mar 2017	10.770		0.000		1.335	Mar 2019	1.335	Continuing	Continuing	Continuing
Subtotal			70.703	56.706		61.861		25.560		1.335		26.895	Continuing	Continuing	N/A
Project Cost Totals			199.809	90.685		127.318		51.178		2.670		53.848	Continuing	Continuing	N/A
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	Project (Number/Name) EB4 / <i>CIRCM</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
EMD Phase	[Redacted]																											
Critical Design Review (CDR) Risk Reduction Activities	[Redacted]																											
CDR	▲ 1																											
Developmental Test Activity	[Redacted]																											
Prototype Deliveries	[Redacted]				[Redacted]																							
Reliability Demonstration Test (RDT)					[Redacted]																							
MS C									▲ 2																			
Multi-Platform A-Kit Development and Integration					[Redacted]																							
LRIP 1									[Redacted]																			
Initial Operational Test and Evaluation (IOT&E) Start													[Redacted]															
FUE																					▲ 3							
FRPDR																					▲ 4							
Initial Operating Capability (IOC)																					▲ 5							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605035A / <i>Common Infrared Countermeasures (CIRCM)</i>	Project (Number/Name) EB4 / <i>CIRCM</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Bridge Activity	4	2014	2	2015
EMD Contract Award/Protest	4	2015	1	2016
EMD Phase	1	2016	4	2018
Critical Design Review (CDR) Risk Reduction Activities	1	2016	1	2017
CDR	1	2017	1	2017
Developmental Test Activity	1	2016	4	2018
Prototype Deliveries	1	2016	1	2018
Reliability Demonstration Test (RDT)	2	2018	4	2018
MS C	4	2018	4	2018
Multi-Platform A-Kit Development and Integration	3	2018	4	2021
LRIP 1	4	2018	4	2019
Initial Operational Test and Evaluation (IOT&E) Start	1	2020	3	2020
FUE	3	2020	3	2020
FRPDR	3	2020	3	2020
Initial Operating Capability (IOC)	4	2021	4	2021

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0605036A / Combating Weapons of Mass Destruction (CWMD)
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	2.008	6.927	11.311	-	11.311	8.919	3.959	0.000	0.000	0.000	33.124
EQ5: Combating Weapons of Mass Destruction (CWMD)	-	2.008	6.927	11.311	-	11.311	8.919	3.959	0.000	0.000	0.000	33.124

A. Mission Description and Budget Item Justification

The Man-Portable Radiological Detection System (MRDS) capability will provide increased radiological and nuclear (RN) detection, localization, presumptive identification and field-confirmatory identification capabilities that are networked to provide situational awareness at the tactical level. The MRDS will support Countering Weapons of Mass Destruction (CWMD) Interdiction and Elimination operations, specifically RN Sensitive Site Assessments and Sensitive Site Exploitation. Future capability may also support Reconnaissance and Surveillance across the full range of CWMD operations. This capability supports Radiological and Nuclear Interdiction (RNI) and Weapons of Mass Destruction - Elimination (WMD-E) operations to: systematically locate, secure, characterize, and disable WMD programs and related capabilities.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	2.089	6.927	5.548	-	5.548
Current President's Budget	2.008	6.927	11.311	-	11.311
Total Adjustments	-0.081	0.000	5.763	-	5.763
• Congressional General Reductions	-0.001	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.080	-			
• Adjustments to Budget Years	-	-	5.763	-	5.763

Change Summary Explanation

FY 2019 increase in the amount of \$5.763M attributable to additional testing requirements.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605036A / <i>Combating Weapons of Mass Destruction (CWMD)</i>				Project (Number/Name) EQ5 / <i>Combating Weapons of Mass Destruction (CWMD)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EQ5: <i>Combating Weapons of Mass Destruction (CWMD)</i>	-	2.008	6.927	11.311	-	11.311	8.919	3.959	0.000	0.000	0.000	33.124
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Man-Portable Radiological Detection System (MRDS) capability will provide increased radiological and nuclear (RN) detection, localization, presumptive identification and field-confirmatory identification capabilities that are networked to provide situational awareness at the tactical level. The MRDS will support Countering Weapons of Mass Destruction (CWMD) Interdiction and Elimination operations, specifically RN Sensitive Site Assessments and Sensitive Site Exploitation. The Joint Point Dosimeter (JPD-I) is intended to replace DoD's legacy dosimeters (the Navy's IM-270 and the Army's PDR-75 reader with the DT-236 watch). The JPD-I will provide a sensor to record and retrieve a Service member's radiation exposure from occupational to tactical levels. Future capability may also support Reconnaissance and Surveillance across the full range of CWMD operations. This capability supports Radiological and Nuclear Interdiction (RNI) and Weapons of Mass Destruction - Elimination (WMD-E) operations to: systematically locate, secure, characterize, and disable WMD programs and related capabilities.

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

	FY 2017	FY 2018	FY 2019
Title: Acquisition Documentation Development	0.180	-	-
Description: Provide the acquisition documentation for the MRDS program MS-C.			
Title: Program Management	0.298	2.289	2.630
Description: Provide Program Management			
FY 2018 Plans: Continue Government program management and Integrated Product Team support.			
FY 2019 Plans: Continue Government program management and Integrated Product Team support.			
FY 2018 to FY 2019 Increase/Decrease Statement: Increase due to additional testing requirements program changes.			
Title: Test & Evaluation Planning	0.090	0.290	0.398
Description: Provides test & evaluation support (ATEC/OTC).			
FY 2018 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605036A / <i>Combating Weapons of Mass Destruction (CWMD)</i>	Project (Number/Name) EQ5 / <i>Combating Weapons of Mass Destruction (CWMD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Provide TEMP development and test coordination planning. FY 2019 Plans: Conduct test and review/approve detail test plans FY 2018 to FY 2019 Increase/Decrease Statement: Increase due to additional testing requirement in 2019				
Title: System Engineering Description: Provide system engineering support to the MRDS program. FY 2018 Plans: Provide system engineering support to the MRDS program. FY 2019 Plans: Provide system engineering support to the MRDS program.		0.470	0.455	0.455
Title: Cybersecurity/Integration Description: Provides cybersecurity thru integration of COTS. FY 2018 Plans: Initiate work on the Situational Awareness Tool and Networking capability. FY 2019 Plans: Continue work on the Situational Awareness Tool and Networking capability through validation testing		0.200	0.563	0.563
Title: Acquisition Logistics Description: Provides Acquisition Logistics support to the MRDS program. FY 2018 Plans: Initiate work on the level of repair analysis, provisioning, Army standard training material and Army standard technical manuals. FY 2019 Plans: Continue work on the level of repair analysis, provisioning, Army standard training material and Army standard technical manuals.		0.300	0.390	0.390
Title: Analytical Support Description: Provide analytical and technical support to the MRDS program.		0.470	-	0.247

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605036A / <i>Combating Weapons of Mass Destruction (CWMD)</i>	Project (Number/Name) EQ5 / <i>Combating Weapons of Mass Destruction (CWMD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>FY 2019 Plans: Provide support to the test by the COTS vendor.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: No effort in FY18.</p>				
<p>Title: Procure LRIP Prototypes</p> <p>Description: Purchases the systems</p> <p>FY 2018 Plans: Procure 12 COTS Systems (2 Types) to support testing and logistics evaluation.</p> <p>FY 2019 Plans: Procure 12 COTS Systems (2 Types) to support operational testing and logistics evaluation.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Minor change due to routine program adjustments.</p>		-	2.680	2.233
<p>Title: Component Testing</p> <p>Description: Provides component testing of the systems.</p> <p>FY 2018 Plans: Initiate radio testing with LRIP prototypes.</p> <p>FY 2019 Plans: Continue radiological performance and environmental testing with LRIP prototypes.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Test preparation begins in 2018 and testing will continue though 2019.</p>		-	0.260	3.395
<p>Title: Program Management JPD - I</p> <p>FY 2019 Plans: Provide Program Management - JPD-I</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase due testing requirements</p>		-	-	0.360
<p>Title: Test & Evaluation Planning JPD- I</p>		-	-	0.640

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605036A / <i>Combating Weapons of Mass Destruction (CWMD)</i>	Project (Number/Name) EQ5 / <i>Combating Weapons of Mass Destruction (CWMD)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
FY 2019 Plans: Conduct Final Operational Test and Evaluation - JPD-I				
FY 2018 to FY 2019 Increase/Decrease Statement: Test to initiate in FY19				
Accomplishments/Planned Programs Subtotals		2.008	6.927	11.311
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				
D. Acquisition Strategy				
<p>Man-portable Radiological Detection System is a single step acquisition strategy starting at Milestone C to acquire Commercial-Off-The-Shelf equipment sets consisting of a Hands-Free search device, a Hand-Held Radioisotope Identification Device, an integrated tactical radio network, and a Situational Awareness tool in order to provide specialized Army units with a net-ready, rugged, and reliable system that can detect, identify, and characterize designated radionuclides and transmit that information securely to tactical, operational, and strategic command levels in near-real time. The contract approach will be a full and open fixed price incentive contract for LRIP systems to support post Milestone C testing, and an indefinite delivery indefinite quantity fixed price incentive contract for the full rate production task order.</p> <p>The Joint Point Dosimeter - Individual (JPD-I) Program Office (PO) will leverage the Navy's market research, testing and down select to meet the Army's requirements. The level of technological maturity is such that JPD-IND will enter the acquisition cycle from MDD at MS C. Currently conducting Production Qualification Testing, the program is working toward a Full Rate Production Decision in 1st Qtr FY19 concurrent with a Full Rate Production Contract Award.</p>				
E. Performance Metrics				
N/A				

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605036A / <i>Combating Weapons of Mass Destruction (CWMD)</i>	Project (Number/Name) EQ5 / <i>Combating Weapons of Mass Destruction (CWMD)</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	Allot	Various : Various	-	0.298	Aug 2017	2.289		2.630	Dec 2018	-		2.630	0.000	5.217	-
Acquisition Document Development	Allot	Various : Various	-	0.180	Aug 2017	-		-		-		-	0.000	0.180	-
Subtotal			-	0.478		2.289		2.630		-		2.630	0.000	5.397	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Contract Award	C/FPIF	TBD : TBD	-	-		2.680	Jun 2017	2.733		-		2.733	0.000	5.413	-
Subtotal			-	-		2.680		2.733		-		2.733	0.000	5.413	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Cybersecurity	MIPR	Edgewood Chemical and Biological Center : Edgewood, Maryland	-	0.200	Sep 2017	0.563		0.563	Jan 2019	-		0.563	0.000	1.326	-
Acquisition Logistics	MIPR	Communications-Electronics Command : Aberdeen Proving Ground, MD	-	0.300	Aug 2017	0.390		0.390	Jan 2019	-		0.390	0.000	1.080	-
Analytical Support	MIPR	Various : Various	-	0.470	Jul 2017	-		0.247	Jan 2019	-		0.247	0.000	0.717	-
Systems Engineering	MIPR	Edgewood Chemical and Biological Center : Aberdeen Proving Ground, MD	-	0.470	Jul 2017	0.455		0.455	Jan 2019	-		0.455	0.000	1.380	-
Subtotal			-	1.440		1.408		1.655		-		1.655	0.000	4.503	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605036A / <i>Combating Weapons of Mass Destruction (CWMD)</i>	Project (Number/Name) EQ5 / <i>Combating Weapons of Mass Destruction (CWMD)</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Acquisition Documentation Development	██████████				██████████																							
Developmental Testing			██████																									
Milestone C							▲																					
LRIP Contract Award							██████																					
LRIP							██████████																					
Component Testing											██████																	
Log Demo and IOT&E															██████													
FRP, NET, and Fielding															██████████													

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605036A / <i>Combating Weapons of Mass Destruction (CWMD)</i>	Project (Number/Name) EQ5 / <i>Combating Weapons of Mass Destruction (CWMD)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Acquisition Documentation Development	1	2017	2	2018
Developmental Testing	3	2017	4	2017
Milestone C	2	2018	2	2018
LRIP Contract Award	3	2018	4	2018
LRIP	3	2018	3	2020
Component Testing	2	2019	4	2019
Log Demo and IOT&E	1	2020	2	2020
FRP, NET, and Fielding	3	2020	4	2024

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605037A / <i>Evidence Collection and Detainee Processing (ECDP)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.214	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.214
EQ6: <i>Evidence Collection and Detainee Processing</i>	-	0.000	0.214	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.214

A. Mission Description and Budget Item Justification

There is no FY 2019 PB Request.

Note: This program element supports development of Law Enforcement Equipment Ensemble Kit (LEEKs). LEEKs consists of a Duty Belt, Belt Keeper, Pouch Handcuff, Surgical Glove Pouch and Flashlight Holder to be used by Military Law Enforcement personnel.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.214	0.000	-	0.000
Current President's Budget	0.000	0.214	0.000	-	0.000
Total Adjustments	0.000	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605037A / Evidence Collection and Detainee Processing (ECDP)	Project (Number/Name) EQ6 / Evidence Collection and Detainee Processing
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EQ6: Evidence Collection and Detainee Processing	-	0.000	0.214	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.214
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

There is no FY 2019 PB Request.

Note: FY18 is the first year PM SPIE will receive these funds.

This funding supports engineering and manufacturing development of Law Enforcement Equipment Ensemble Kit (LEEKS). LEEKS consists of the following: Duty Belt, Belt Keeper, Pouch Handcuff, Surgical Glove Pouch and Flashlight Holder to be used by Military Law Enforcement personnel.

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

	FY 2017	FY 2018	FY 2019
Title: LEEKS	-	0.214	-
FY 2018 Plans: Obtain MDD for the Law Enforcement Equipment Ensemble Kit (LEEK) and conduct Operational Testing to support a MS-C in FY20. Procure fully mature Commercial Off-the-Shelf (COTS) and Government Off the Shelf (GOTS) NDI test assets and conduct User Evaluations supporting the DA Law Enforcement mission evaluating interoperability and durability. Conduct tests on the interoperability, durability and shade on test assets.			
FY 2018 to FY 2019 Increase/Decrease Statement: FY18 is the only year RDTE is required			
Accomplishments/Planned Programs Subtotals	-	0.214	-

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

N/A

Remarks

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605037A / Evidence Collection and Detainee Processing (ECDP)	Project (Number/Name) EQ6 / Evidence Collection and Detainee Processing

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Purchase COTS Items					▲ 1																							
User Evaluation					■																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605037A / <i>Evidence Collection and Detainee Processing (ECDP)</i>	Project (Number/Name) EQ6 / <i>Evidence Collection and Detainee Processing</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Purchase COTS Items	2	2018	2	2018
User Evaluation	3	2018	3	2018

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0605038A / NBC Reconnaissance Veh (NBCRV) Sensor Suite							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	16.125	17.154	-	17.154	5.985	4.942	0.931	0.000	0.000	45.137
<i>EQ7: NBC Reconnaissance Vehicle (NBCRV) Sensor Suite</i>	-	0.000	16.125	17.154	-	17.154	5.985	4.942	0.931	0.000	0.000	45.137

Note

FY2016-17 Funding is reflected under PE0603627, Project Code E79

A. Mission Description and Budget Item Justification

This program provides a Sensor Suite Upgrade (SSU) for the Stryker Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV). The NBCRV Sensor Suite is the Mission Equipment Package for the Stryker NBCRV and consists of chemical point detectors, a standoff chemical vapor detector, a biological point detector, a chemical vapor sampling system, radiological detectors, and the Sensor Processing Group. NBCRV SS provides the Stryker NBCRV the ability to detect, identify, collect, report, and mark NBC Hazards. The Stryker NBCRV SSU will improve chemical, biological and radiological and nuclear detection and identification capabilities, and reduce sustainment costs over the current system. A Chemical Surface Detector (CSD) will be developed to replace the Dual Wheel Sampling System to increase maneuver speed when conducting NBC missions and increase reliability. In FY18 the CSD program will deliver final prototypes and complete chemical, environmental and on-the-move testing.

B. Program Change Summary (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	16.125	17.174	-	17.174
Current President's Budget	0.000	16.125	17.154	-	17.154
Total Adjustments	0.000	0.000	-0.020	-	-0.020
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.020	-	-0.020

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605038A / NBC Reconnaissance Veh (NBCRV) Sensor Suite				Project (Number/Name) EQ7 / NBC Reconnaissance Vehicle (NBCRV) Sensor Suite			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EQ7: NBC Reconnaissance Vehicle (NBCRV) Sensor Suite	-	0.000	16.125	17.154	-	17.154	5.985	4.942	0.931	0.000	0.000	45.137
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY2016 and FY2017 Funding is reflected under PE0603627A, Project Code E79

A. Mission Description and Budget Item Justification

This program provides a Sensor Suite Upgrade (SSU) for the Stryker Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV). The NBCRV Sensor Suite is the Mission Equipment Package for the Stryker NBCRV and consists of chemical point detectors, a standoff chemical vapor detector, a biological point detector, a chemical vapor sampling system, radiological detectors, and the Sensor Processing Group. NBCRV SS provides the Stryker NBCRV the ability to detect, identify, collect, report, and mark NBC Hazards. The Stryker NBCRV SSU will improve chemical, biological and radiological and nuclear detection and identification capabilities, and reduce sustainment costs over the current system. A Chemical Surface Detector (CSD) will be developed to replace the Dual Wheel Sampling System to increase maneuver speed when conducting NBC missions and increase reliability. In FY18 the CSD program will deliver final prototypes and complete chemical, environmental and on-the-move testing.

Note: FY16-FY17 funded under 0603627A E79, Smoke, Obscurant and Target Defeating Sys-Adv Dev

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

	FY 2017	FY 2018	FY 2019
Title: Product Development TMRR	-	9.975	3.803
FY 2018 Plans: Continue CSD TMRR sensor suite upgrade development.			
FY 2019 Plans: Continue CSD TMRR sensor suite upgrade development, and initiate CSD EMD phase.			
FY 2018 to FY 2019 Increase/Decrease Statement: Increase contracting funding in FY18 accelerated the completion and reduced the funding requirements of TMRR in FY19.			
Title: Product Development EMD	-	-	6.610
FY 2019 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605038A / NBC Reconnaissance Veh (NBCRV) Sensor Suite	Project (Number/Name) EQ7 / NBC Reconnaissance Vehicle (NBCRV) Sensor Suite		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Initiate a Sensor Integration EMD phase				
FY 2018 to FY 2019 Increase/Decrease Statement: Funding reduced due to contracts moving from three (3) TMRR contracts to the start of Sensor Integration EMD efforts.				
Title: Test and Evaluation		-	4.100	4.500
FY 2018 Plans: Continue test and evaluation planning and support for sensor suite upgrade prototypes.				
FY 2019 Plans: Continue test and evaluation planning and support for sensor suite upgrade prototypes.				
FY 2018 to FY 2019 Increase/Decrease Statement: Testing will ramp up from FY18 to FY19.				
Title: Integrated Logistics Support		-	0.250	0.250
FY 2018 Plans: Continue Integrated Logistics Support (ILS) and integration support to the sensor suite upgrades.				
FY 2019 Plans: Continue Integrated Logistics Support (ILS) and integration support to the sensor suite upgrades.				
Title: Project Management Personnel		-	1.800	1.991
FY 2018 Plans: Continue Government program management, system engineering, and Integrated Product Team (IPT) support.				
FY 2019 Plans: Continue Government program management, system engineering, and Integrated Product Team (IPT) support.				
FY 2018 to FY 2019 Increase/Decrease Statement: Increase to account for inflation and potential salary/team shifts.				
Accomplishments/Planned Programs Subtotals		-	16.125	17.154
C. Other Program Funding Summary (\$ in Millions)				
N/A				
Remarks				

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605038A / NBC Reconnaissance Veh (NBCRV) Sensor Suite	Project (Number/Name) EQ7 / NBC Reconnaissance Vehicle (NBCRV) Sensor Suite

D. Acquisition Strategy

Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite (NBCRVSS) Upgrade is an upgrade for the Stryker Nuclear Biological Chemical Reconnaissance Vehicle. The contract approach of the Chemical Surface Detector (CSD) will be a Full and Open Cost Plus Fixed Fee competitive prototyping contract. After the TMRR phase, the contract approach for CSD will be a Full and Open Cost Plus Incentive Fee Engineering Manufacturing Development contract with Fixed Price Incentive Fee options for Low Rate Initial Production and Full Rate Production.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605038A / NBC Reconnaissance Veh (NBCRV) Sensor Suite				EQ7 / NBC Reconnaissance Vehicle (NBCRV) Sensor Suite							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management Personnel	MIPR	JPM NBC CA : Edgewood, MD	-	-		1.800	Nov 2017	1.991	Nov 2018	-		1.991	Continuing	Continuing	Continuing
Subtotal			-	-		1.800		1.991		-		1.991	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development Sensor Integration EMD Phase	C/CPIF	TBD : TBD	-	-		6.666	Jun 2018	6.610	Jun 2019	-		6.610	Continuing	Continuing	Continuing
Product Development (NGCD 3M)	C/CPIF	TBD : TBD	-	-		3.309		-		-		-	0.000	3.309	-
Product Development (CSD) FLIR (TMRR)	Option/CPIF	FLIR : Elkridge, MD	-	-		-		0.743	Nov 2018	-		0.743	0.000	0.743	-
Product Development (CSD) L3 (TMRR)	Option/CPIF	L3 : Sonoma, CA	-	-		-		1.666	Nov 2018	-		1.666	0.000	1.666	-
Product Development (CSD) UTC (TMRR)	Option/CPIF	UTC Areospace : Pomona, CA	-	-		-		1.394	Nov 2018	-		1.394	0.000	1.394	-
Subtotal			-	-		9.975		10.413		-		10.413	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support (ILS)	MIPR	ECBC : Edgewood, MD	-	-		0.250	Nov 2017	0.250	Nov 2018	-		0.250	Continuing	Continuing	Continuing
Subtotal			-	-		0.250		0.250		-		0.250	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605038A / NBC Reconnaissance Veh (NBCRV) Sensor Suite	Project (Number/Name) EQ7 / NBC Reconnaissance Vehicle (NBCRV) Sensor Suite
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	ECBC : Edgewood, MD	-	-		4.100	Oct 2017	4.500	Oct 2018	-		4.500	Continuing	Continuing	Continuing
Subtotal			-	-		4.100		4.500		-		4.500	Continuing	Continuing	N/A
			Prior Years	FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-		16.125		17.154		-		17.154	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605038A / NBC Reconnaissance Veh (NBCRV) Sensor Suite	Project (Number/Name) EQ7 / NBC Reconnaissance Vehicle (NBCRV) Sensor Suite	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Design and Fabrication (Continued from PE0603627 E79)	████████████████████				████████████████████				████████████████████																			
Chemical Testing	████████████████████				████████████████████				████████████████████																			
Environmental On-the-move Testing	████████████████████				████████████████████				████████████████████																			
Milestone B	████████████████████				████████████████████				████████████████████																			
Design and Fabrication	████████████████████				████████████████████				████████████████████				████████████████████															
Production Qualification Test (PQT)	████████████████████				████████████████████				████████████████████				████████████████████				████████████████████											
Platform PQT	████████████████████				████████████████████				████████████████████				████████████████████				████████████████████				████████████████████							
Milestone C	████████████████████				████████████████████				████████████████████				████████████████████				████████████████████				████████████████████							
Low Rate Initial Production (LRIP)	████████████████████				████████████████████				████████████████████				████████████████████				████████████████████				████████████████████							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605038A / NBC Reconnaissance Veh (NBCRV) Sensor Suite	Project (Number/Name) EQ7 / NBC Reconnaissance Vehicle (NBCRV) Sensor Suite

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Design and Fabrication (Continued from PE0603627 E79)	2	2017	3	2019
Chemical Testing	1	2018	3	2019
Environmental On-the-move Testing	4	2018	3	2019
Milestone B	3	2019	3	2019
Design and Fabrication	3	2019	1	2021
Production Qualification Test (PQT)	2	2021	1	2022
Platform PQT	2	2022	1	2023
Milestone C	4	2023	4	2023
Low Rate Initial Production (LRIP)	4	2023	4	2024

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605041A / <i>Defensive CYBER Tool Development</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	32.535	55.165	36.626	-	36.626	89.183	42.567	99.442	137.944	0.000	493.462
EV5: <i>Defensive Cyber Operations</i>	-	32.535	55.165	36.626	-	36.626	89.183	42.567	99.442	137.944	0.000	493.462

Note
 This program element is a continuation of efforts funded in FY 2016 in PE 0303140, project 491.

A. Mission Description and Budget Item Justification

The Defensive Cyber Tool Development (DCTD) group of programs designs, builds, and tests the advanced Cyber tools and infrastructure that enables active defense of the network from Home Station Mission Command Centers (HSMCC) to the deployed tactical Command Post (CP). This capabilities will enable integration of the Cyber Mission Force (CMF) with the regional and local cyber network defense elements. These tools will provide cutting edge hardware and software, integrated with existing infrastructure and tools to facilitate active Defensive Cyber Operations (DCO). Cyber Tool Development will include data analytics solutions to enable the ability to correlate and analyze the massive amount of data coming across the network and provide timely situational awareness. It will also include development, integration, and testing of Defensive Cyber Tools and infrastructure that will facilitate pushing cyber sensor data to the data analytics engine as well as support remote access to prevent or react to a cyber incident. Defensive Cyber Tool Development includes creation of developmental environments for emerging commercial tool assessment as well as Army Cyber Soldier development of tools. Additionally, this program element supports the development of a Cyber Mission Planning tool that is an application-based, scalable, secure warfighting system to support cyberspace operations mission planning and command. The Mission Planning tool helps identify Cyberspace Key Terrain (KT-C) and determines probable attack vectors; and produces a set of relevant internal defense measures, triggers, and decision points.

This program element will support the start of several DCO programs beginning in FY19 and supports material solutions for the October 2016 Joint Requirements Oversight Council (JROC) approved Defensive Cyberspace Operations Information Systems Initial Capabilities Document (IS ICD). The hardware and software capabilities enable Army Cyber defense forces to protect, search and discover, maneuver and engage, and mitigate and respond to enemy cyberspace operations. DCO programs will allow near real-time employment of defensive measures that will allow friendly cyber forces to maintain advantage. These programs directly support US Cyber Command Integrated Priority List #2 Produce Advanced Cyberspace Infrastructure and #5 Defensive Forces to execute passive and active defense operations at net-speed.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605041A / <i>Defensive CYBER Tool Development</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	84.336	55.165	23.522	-	23.522
Current President's Budget	32.535	55.165	36.626	-	36.626
Total Adjustments	-51.801	0.000	13.104	-	13.104
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	11.600	-	11.600
• R1 Annex Update	-51.801	-	1.504	-	1.504

Change Summary Explanation

FY 2019 Base funding in the amount of \$13.104 million was added to support ARCYBER DCO Acquisition Authority for rapid development capabilities, prototype funding for engineering, testing, and development of the Tactical DCO Infrastructure, Lightweight Analytics capability, Cyber Protection Team communicator capability, integration of Remote Management Capability, Creation of Real-time tools development environment.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605041A / <i>Defensive CYBER Tool Development</i>				Project (Number/Name) EV5 / <i>Defensive Cyber Operations</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
<i>EV5: Defensive Cyber Operations</i>	-	32.535	55.165	36.626	-	36.626	89.183	42.567	99.442	137.944	0.000	493.462
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

- Defensive Cyberspace Operations - Infrastructure (DCO-I) Tactical - (PEO C3T)
- Defensive Cyberspace Operations (DCO) - Cyber Data Analytics - (PEO EIS)
- Defensive Cyberspace Operations - Mission Planning - (PEO EIS)
- Defensive Cyberspace Operations - Tools Suite - (PEO EIS)
- Defensive Cyberspace Operations - Garrison DCO Platform - (PEO EIS)

A. Mission Description and Budget Item Justification

DCO programs provide initial capabilities to Cyber Protection Teams. Teams enable passive and active cyberspace defensive operations to preserve friendly cyberspace capabilities, and protect data, networks, net-centric capabilities, and other designated systems. FY2019 RDT&E DCO efforts consists of the following (5) critical capabilities:

1. Tactical DCO Infrastructure: Tactical system (computing infrastructure) which resides within the Command Post, at Battalion through Corps, for both organic Cyber Network Defenders as well as remote access by Cyber Protection Teams (CPT) through the Local Area Network (LAN) to support defense of the Network (PEO C3T)
2. Cyber Data Analytics: Analytics that leverage Defense Information Security Agency (DISA) Acropolis analytics (PEO EIS)
3. Mission Planning: The hardware and software baseline for remote cyber maneuver based on the Defense Advanced Research Projects Agency (DARPA) Plan X (PEO EIS)
4. Tools Suite: The environment and tool development of software to enable Army Cyber forces to perform DCO missions (PEO EIS)
5. Garrison DCO Platform: The infrastructure software enables the virtualization and remote management of tools and platforms used to conduct DCO missions (PEO EIS)

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

	FY 2017	FY 2018	FY 2019
Title: Defensive Cyberspace Operations - Infrastructure (DCO-I) Tactical - (PEO C3T)	5.819	15.427	6.343
Description: Defensive Cyberspace Operations - Infrastructure (DCO-I) Tactical program integrates and delivers key hardware and software that enables the Cyber Mission Forces to protect, search and discover, maneuver and engage, and mitigate and respond to enemy cyberspace operations.			
FY 2018 Plans: FY18 continues the Engineering Design and Development for Network Operations software in support of the Requirements Definition Package (RDP) for the Tactical Defensive Cyber Operations-Infrastructure (TDI), which further integrates existing			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605041A / <i>Defensive CYBER Tool Development</i>	Project (Number/Name) EV5 / <i>Defensive Cyber Operations</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>capability and extends that capability down to the Battalion Level. This funding initializes the program and funds the development effort for the first build cycle. FY18 funding continues the delivery of architecture products that help drive subsequent builds. TDI testing will include developmental events conducted on lab configurations and networks followed by an Operational Evaluation using Soldiers and live equipment.</p> <p>FY 2019 Plans: The FY19 funding will support completion of prototype engineering, testing and initiate development of the initial capability release of TDI. FY19 funds will also support the development of documentation required to support the development request for proposal release.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: The FY2018 funding will support initial TDI prototyping and testing. The FY2019 effort will complete prototyping, testing and support the development of documentation required to get MDA approval to contract for limited TDI capability and subsequent fielding.</p>				
<p>Title: Defensive Cyberspace Operations (DCO) - Cyber Data Analytics - (PEO EIS)</p> <p>Description: The Defensive Cyberspace Analytics (DCA) capability offers interfaces and visualizations accessible by cyberspace defenders at all levels to facilitate counter-reconnaissance activities meant to discover the presence of advanced or sophisticated cyber threats and vulnerabilities.</p> <p>FY 2018 Plans: FY18 transitions the Big Data Pilot to a data analytics capability for Cyber Protection Brigade and continues the Big Data Pilot Initiative. Initiative focus is on ingesting structured, semi-structured, and unstructured data from multiple data sources (e.g., Joint Regional Security Stacks (JRSS), intrusion detection systems, intrusion prevention systems, network device log files, trouble tickets, firewalls, proxies, web and applications server log files, etc) and providing situational awareness of cyberspace battlefield.</p> <p>FY 2019 Plans: FY19 focuses on creating a distributed analytic environment. This environment will allow for query of data that is resident at the Tactical, Deployable, or Garrison locations. Additionally FY19 will see the development of a lightweight analytic engine that can be placed on Tactical, Deployable, or Garrison systems to allow local operators immediate access to emerging threat data and forward sensor data. Additional analytics that will be developed include: Data Discovery, Attack Surface Analysis, Perimeter Defense Threat Analysis, and video analysis.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p>		3.928	14.570	8.700

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605041A / <i>Defensive CYBER Tool Development</i>	Project (Number/Name) EV5 / <i>Defensive Cyber Operations</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
FY18 effort will focus on Big Data Platform upgrades. FY19 funding will support the integration of Lightweight Analytics and packaged deployment scripts development.				
<p>Title: Defensive Cyberspace Operations (DCO) - Mission Planning - (PEO EIS)</p> <p>Description: Mission Planning focuses on creating an Application-based, scalable, secure warfighting system to support cyberspace operations mission planning and command at the global, regional, and local levels. The Mission Planning capability enables Cyber Defenders to identify Cyberspace Key Terrain (KT-C); determine probable attack vectors; produce a set of relevant internal defense measures, triggers, and decision points.</p> <p>FY 2018 Plans: FY18 transitions the Defense Advanced Research Projects Agency (DARPA) Plan X capability to the Army and transitions the capability from a Technology Readiness Level of 5 to 6. and enhances the systems abilities to collaborate with other DCO capabilities, providing the operator with a unified mission planning and execution capability. Specific focus will be placed on creating battlespace awareness (SA), mission planning, course of action development, war gaming and execution capabilities.</p> <p>FY 2019 Plans: FY19 integrates the cyber analytics capability through an interface into the mission planning solutions as well as integration of Cyber Protection Team Tool suites to allow for seamless transitions from one tool to another during a mission. Additional functionality such as a team communicator, allowing teams to collaborate and share site picture, as well as automated planner capabilities that ingest operations order data, deconstruct and recommend applications for the mission will be added.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY19 will continue to integrate the cyber analytics capability through an interface into the mission planning solutions as well as integration of Cyber Protection Team Tool suites to allow for seamless transitions from one tool to another during a mission.</p>		10.314	14.819	14.743
<p>Title: Defensive Cyberspace Operations (DCO) - Tools Suite - (PEO EIS)</p> <p>Description: The DCO Tool Suite is a flexible and dynamic (Joint Information Environemnt and Common Operating Environment compliant), software based set of warfighting capabilities that enable CPTs, Regional Cyber Center (RCC), and in some cases local defenders, to perform DCO and cyberspace security missions. DCO tools consist of software, data, or an applications that support or directly cause effects related to CMF and cyberspace workforce tasks. They are executed or managed within a platform.</p> <p>FY 2018 Plans:</p>		-	4.540	4.540

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605041A / <i>Defensive CYBER Tool Development</i>	Project (Number/Name) EV5 / <i>Defensive Cyber Operations</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>Engineering of a Development/Operational environment for cyberspace defenders to develop or modify DCO tools based on operational threats. The environment is based on and leverages similar Offensive Cyber capabilities</p> <p>FY 2019 Plans: Development and resourcing of capabilities for Cyber Protection Teams (CPTs) to do real time writing, modification, and customization of software code and algorithms for analytics in response to mission changes; resourcing includes software for testing of newly written code, access to contracted industry experts and research facility support for creation of tools in response to emerging threats</p>			
<p>Title: Defensive Cyberspace Operations (DCO) - Garrison DCO Platform - (PEO EIS)</p> <p>Description: The Garrison DCO Platform consists of pre-positioned dedicated compute and storage resources residing at high risk locations. This infrastructure serves as a remote capability for cyberspace defenders. Remote management software is utilized to provide cross-domain access to all defensive cyber platforms, serving as the maneuver capability for defenders.</p> <p>FY 2018 Plans: The prototyping of the remote management cross domain solution at Fort Gordon to support the Army's Cyber Protection Brigade.</p> <p>FY 2019 Plans: The enhancement of remote management capability to include passive network mapping, remote management of advanced sensors, and interface with Reserve and National Guard capabilities.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY18 funding will support the Garrison DCO prototyping. FY19 effort will be for the enhancement of remote management capability to include passive network mapping, remote management of advanced sensors, and interface with Reserve and National Guard capabilities.</p>	12.474	5.809	2.300
Accomplishments/Planned Programs Subtotals	32.535	55.165	36.626

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• B63103: <i>OPA Defensive Cyber Operations (MDEP FPPF SSN B63103)</i>	19.329	24.004	23.303	-	23.303	36.492	41.100	68.704	50.000	Continuing	Continuing

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605041A / <i>Defensive CYBER Tool Development</i>	Project (Number/Name) EV5 / <i>Defensive Cyber Operations</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• N/A: <i>OMA Defensive Cyber Operations (MDEP MU2Z SAG 432612)</i>	-	0.640	3.000	-	3.000	5.000	5.000	5.000	-	Continuing	Continuing
• B63103: <i>OPA Defense Cyber Operations (MDEP MU2Z SSN B63103)</i>	-	15.734	32.200	-	32.200	25.470	28.555	26.800	47.908	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Defensive Cyber Tool Development line will support multiple Information Systems - Requirement Development Packages (IS RDP) that result in multiple programs. The Army will conduct a Materiel Development Decisions (MDD) in FY18 based upon the Defensive Cyberspace Operations (DCO) Information System Initial Capabilities Document (IS ICD).

Defensive Cyber Operations Projects will initially be managed as an Acquisition Category III program using Department of Defense "IT Box" strategy and an evolutionary acquisition model. System designs focus on open architecture and open source capabilities. Development focuses on implementation of a modular design to maximize innovation through continuous releases. Modules will be refined by industry as a component through adoption of prototypes. Each program will have a prime integrator (single contractor) that integrates the new modules. The Government will assess and create prototypes of new modules under the Consortium for Command, Control, Communications and Computer Technologies (C5) Other Transactional Agreement contract vehicle. Monthly technical interchange discussions with C5 members will occur to insure new technologies are inserted as soon as possible and will lead to semiannual fielding decisions for new modules.

The overall strategy of the Tactical DCO Infrastructure program is to develop the software infrastructure and deployment scripts that provide a solution that is physically and/or logically converged with the Army's Tactical Server Infrastructure (TSI) to minimize the size, weight, and power (SWaP) requirements in a Tactical Operations Center (TOC) or Tactical Command Post (TCP). The capability will provide pre-positioned infrastructure at echelons Battalion through Corps that enables global, regional, and local cyberspace defenders to conduct DCO mission planning and protection measures. Execution of the TDI program will be a combination of Government entities and commercial vendors.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605041A / <i>Defensive CYBER Tool Development</i>	Project (Number/Name) EV5 / <i>Defensive Cyber Operations</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Tactical Defensive Cyber Operations-Infrastructure (TDI) (PEO C3T)	C/FFP	PEO C3T : Aberdeen Proving Ground, MD	-	4.188		2.825		2.283		-		2.283	Continuing	Continuing	Continuing
Defensive Cyberspace Operations (DCO) - Cyber Data Analytics (PEO EIS)	C/FFP	PEO EIS : Ft Belvoir, VA	-	0.228	Sep 2017	0.700		0.700		-		0.700	Continuing	Continuing	Continuing
Defensive Cyberspace Operations - Tools Suite (PEO EIS)	C/FFP	PEO EIS : Ft Belvoir, VA	-	-		0.100		0.100		-		0.100	Continuing	Continuing	Continuing
Defensive Cyberspace Operatons - Garrison DCO Platform (PEO EIS)	C/FFP	PEO EIS : Ft Belvoir, VA	-	0.724	Sep 2017	0.300		0.300		-		0.300	Continuing	Continuing	Continuing
Defensive Cyberspace Operatios - Mission Planning (PEO EIS)	C/FFP	PEO EIS : Ft Belvoir, VA	-	0.219	Sep 2017	0.200		0.200		-		0.200	Continuing	Continuing	Continuing
Subtotal			-	5.359		4.125		3.583		-		3.583	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Tactical Defensive Cyber Operations-Infrastructure (TDI) (PEO C3T)	C/TBD	Aberdeen Proving Ground : MD	-	1.631		11.957		3.177		-		3.177	Continuing	Continuing	Continuing
Defensive Cyberspace Operations - Cyber Data Analytics	C/FFP	ACC-PI : NJ	-	3.700	Sep 2017	14.570		4.000		-		4.000	Continuing	Continuing	Continuing
Defensive Cyberspace Operations - Tools Suite (PEO EIS)	C/TBD	ACC-RI : IL	-	-		4.540		4.140		-		4.140	Continuing	Continuing	Continuing
Defensive Cyberspace Operations - Garrison DCO Platform (PEO EIS)	C/FFP	ACC-RI : IL	-	2.060		5.809		1.000		-		1.000	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0605041A / Defensive CYBER Tool Development				EV5 / Defensive Cyber Operations								
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Defensive Cyberspace Operations - Mission Planning (PEO EIS)	C/CPFF	AFRL : NY	-	10.095		13.519		14.543		-		14.543	Continuing	Continuing	Continuing	
Defensive Cyberspace Operations - Garrison DCO Platforms (PEO EIS)	C/Various	ACC-PI : NJ	-	9.690		-		-		-		-	Continuing	Continuing	Continuing	
Subtotal			-	27.176		50.395		26.860		-		26.860	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Tactical Defensive Cyber Operations-Infrastructure (TDI) (PEO C3T)	C/TBD	Aberdeen Proving Ground : MD	-	-		0.215		-		-		-	0.000	0.215	-	
Subtotal			-	-		0.215		-		-		-	0.000	0.215	N/A	
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Tactical Defensive Cyber Operations-Infrastructure (TDI) (PEO C3T)	C/TBD	Aberdeen Proving Ground : MD	-	-		0.430		0.883		-		0.883	Continuing	Continuing	Continuing	
Defensive Cyberspace Operations - Cyberspace Analytics (PEO EIS)	C/TBD	ACC-RI : IL	-	-		-		4.000		-		4.000	Continuing	Continuing	Continuing	
Defensive Cyberspace Operations - Tools Suite (PEO EIS)	C/TBD	ACC-RI : IL	-	-		-		0.300		-		0.300	Continuing	Continuing	Continuing	

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605041A / <i>Defensive CYBER Tool Development</i>	Project (Number/Name) EV5 / <i>Defensive Cyber Operations</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Tactical DCO-I Materiel Development Decision					▲ 1 TDI MDD																							
Tactical DCO-I ARB Approval of Requirements Definition Package					▲ 2 TDI RDP approval																							
Tactical DCO-I -Prototyping									■ TDI Prototyping																			
Tactical DCO-I - Prototype Test/Fix/Test Cycle									■ TDI Testing																			
Tactical DCO-I Limited Fielding Decision for initial capability													▲ 4 TDI Fielding decision															
DCO - Cyber Analytics (Big Data Platform)													■ DCO CA Big Data Platform															
DCO - Cyber Analytics (Attack Surface)									■ DCO CA Attack Surface																			
DCO - Cyber Analytics (Lightweight Analytics)									■ DCO CA Lightweight Analytics																			
DCO - Cyber Analytics (Artificial Intelligence)									▲ 3 DCO CA Artificial Intelligence																			
DCO - Mission Planning (Force Management)									■ DCO MP Force Management Delivered																			
DCO - Mission Planning (Force Management SIPR)									■ DCO MP Force Management SIPR																			
DCO - Mission Planning (Network Visualization)									■ DCO MP Network Visualization																			
DCO - Mission Planning (Team Communicator)									■ DCO MP Team Communicator																			

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605041A / <i>Defensive CYBER Tool Development</i>	Project (Number/Name) EV5 / <i>Defensive Cyber Operations</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
DCO - Mission Planning (Wargaming)																												
DCO - Tools Suite (CPT Tool Suite 0)																												
DCO - Tools Suite (CPT Tool Suite 1)																												
DCO - Tools Suite (CPT Tool Suite 2)																												
DCO - Tools Suite (CPT Tool Suite 3)																												
DCO - Garrison DCO Platform (FY17)																												
DCO - Garrison DCO Platform (FY18)																												
DCO - Garrison DCO Platform (FY19)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605041A / <i>Defensive CYBER Tool Development</i>	Project (Number/Name) EV5 / <i>Defensive Cyber Operations</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Tactical DCO-I Materiel Development Decision	2	2018	2	2018
Tactical DCO-I ARB Approval of Requirements Definition Package	3	2018	3	2018
Tactical DCO-I -Prototyping	2	2018	1	2019
Tactical DCO-I - Prototype Test/Fix/Test Cycle	4	2018	3	2019
Tactical DCO-I Limited Fielding Decision for initial capability	2	2020	2	2020
DCO - Cyber Analytics (Big Data Platform)	1	2017	4	2017
DCO - Cyber Analytics (Attack Surface)	1	2018	4	2018
DCO - Cyber Analytics (Lightweight Analytics)	2	2018	2	2019
DCO - Cyber Analytics (Artificial Intelligence)	3	2019	3	2019
DCO - Mission Planning (Force Management)	1	2017	3	2017
DCO - Mission Planning (Force Management SIPR)	3	2017	2	2018
DCO - Mission Planning (Network Visualization)	1	2018	3	2018
DCO - Mission Planning (Team Communicator)	2	2018	1	2019
DCO - Mission Planning (Wargaming)	1	2019	3	2019
DCO - Tools Suite (CPT Tool Suite 0)	1	2017	3	2017
DCO - Tools Suite (CPT Tool Suite 1)	1	2018	1	2019
DCO - Tools Suite (CPT Tool Suite 2)	3	2018	3	2019
DCO - Tools Suite (CPT Tool Suite 3)	3	2019	1	2020
DCO - Garrison DCO Platform (FY17)	1	2017	1	2018
DCO - Garrison DCO Platform (FY18)	1	2018	1	2019
DCO - Garrison DCO Platform (FY19)	3	2018	3	2019

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0605042A / Tactical Network Radio Systems (Low-Tier)
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	14.198	20.076	3.829	-	3.829	10.062	21.750	22.066	24.580	0.000	116.561
FA1: Manpack Radio	-	10.347	10.039	1.959	-	1.959	5.030	10.875	11.033	12.290	0.000	61.573
FA2: Rifleman Radio (RR)	-	3.851	10.037	1.870	-	1.870	5.032	10.875	11.033	12.290	0.000	54.988

A. Mission Description and Budget Item Justification

The Handheld, Manpack, and Small Form Fit (HMS) radio program is a materiel solution providing software-defined radio systems that are tailorable and scalable to support the Chief of Staff of the Army's "fight tonight" strategy. 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.

HMS encompasses the Handheld Radios (one-channel Rifleman Radio (RR) and two-channel Leader Radio (LR)), Manpack Radio (MP), and Small Form Fit (SFF) radios. HMS radios will provide voice and support for data services such as text, control graphics, imagery, video, and telemetry to Warfighters and tactical end user devices including handheld, embedded, and larger computing devices, as well as unmanned systems. The program office will continue with the ongoing competition to procure the newest generation of software defined radios capable of running the threshold waveforms, to include MUOS for MP, and will pursue alternative waveforms to reduce the complexity of Mobile AdHoc Networking waveforms, improve spectral efficiency, and seek Electronic Counter-Countermeasures improvements for operations in contested environment.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	18.824	20.076	7.651	-	7.651
Current President's Budget	14.198	20.076	3.829	-	3.829
Total Adjustments	-4.626	0.000	-3.822	-	-3.822
• Congressional General Reductions	-4.059	-	-	-	-
• Congressional Directed Reductions	-	-	-	-	-
• Congressional Rescissions	-	-	-	-	-
• Congressional Adds	-	-	-	-	-
• Congressional Directed Transfers	-	-	-	-	-
• Reprogrammings	-	-	-	-	-
• SBIR/STTR Transfer	-0.560	-	-	-	-
• Adjustments to Budget Years	-	-	-3.822	-	-3.822
• FFRDC	-0.007	-	-	-	-

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

Appropriation/Budget Activity
2040: *Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)*

R-1 Program Element (Number/Name)
PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*

Change Summary Explanation

FY 2019 budget reduction from \$7.651 Million to \$3.829 Million reflects MP radio reaching end of operational testing in preparation for full rate production.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FA1: <i>Manpack Radio</i>	-	10.347	10.039	1.959	-	1.959	5.030	10.875	11.033	12.290	0.000	61.573
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

HMS is structured as a single program of record. The MP radio is a NSA certified Type 1 radio used for transmission of up to SECRET information. MP is capable of providing two simultaneous channels of secure voice and data communications using SINCGARS, SRW, Demand Assigned Multiple Access Satellite Communication, Mobile User Objective System (MUOS), and other advanced networking waveforms. The MP provides range extension and connects soldiers in the lower tier network to the mid-tier network. It is interoperable with legacy waveforms and capable of route and retransmission and cross-banding. The MP provides networking waveforms connectivity, Networked LOS / BLOS voice and data communications. The MP will serve as the vehicular and man-packable tactical LOS radio.

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

	FY 2017	FY 2018	FY 2019
<p>Title: Program Management</p> <p>Description: PdM HMS Manpack's program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning and Integrated Product Team meetings.</p> <p>FY 2018 Plans: During this timeframe, will provide overall management and oversight to implement PdM HMS acquisition strategy. Includes Core, Matrix, and Contractor support.</p> <p>FY 2019 Plans: During this timeframe, will provide overall management and oversight to implement PdM HMS acquisition strategy. Includes Matrix and Contractor support.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: The decrease in requirement is a result of the removal of Core support as this requirement will be covered with OMA funds starting in FY19.</p>	0.312	0.600	0.450
<p>Title: HMS Engineering/Technical Support</p> <p>Description: Overall technical analysis support to PdM HMS' Manpack products.</p> <p>FY 2018 Plans: To provide technical support, including systems engineering to evaluate technical alternatives and test support. System Engineering efforts includes: communication architecture analysis, identifying alternatives to reduce costs, improving system</p>	1.142	0.700	0.700

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>performance, and achieve tactical radio objectives. Technical test support includes: planning and execution of laboratory and field test events, support for testing of prototypes, Engineering Design Models (EDMs), commercial radio solutions, Developmental and Operational Test events, and data collection/reduction/analysis of tactical radio performance.</p> <p>FY 2019 Plans: To provide technical support, including systems engineering to evaluate technical alternatives and test support. System Engineering efforts includes: communication architecture analysis, identifying alternatives to reduce costs, improving system performance, and achieve tactical radio objectives. Technical test support includes: planning and execution of laboratory and field test events, support for testing of prototypes, Engineering Design Models (EDMs), commercial radio solutions, Developmental and Operational Test events, and data collection/reduction/analysis of tactical radio performance.</p>				
<p>Title: Test and Evaluation</p> <p>Description: Manpack's Test and Evaluation focuses on the key technical and operational characteristics of the system: Radio Frequency performance, security, Reliability, Availability & Maintainability, suitability and survivability requirements, in addition to operational environmental performance requirements as per the Capability Production Document. All radios awarded a contract were required to go through the Qualification Test (QT) to qualify for a Customer Test (CT). Following CT there will be a Sandbox and Soldier Feedback Study and Field / Lab Based Risk Reduction Test (FBRR/LBRR) that will serve as risk reduction events prior to Operational Test (OT) to ensure the radio is operational at full capability and ready to be used by soldiers. The QT and CT are complete and were executed by Electronic Proving Ground.</p> <p>The QT validated the manufacturers' ability to meet the minimum functional requirements identified in the Performance Requirements Document. All vendors successfully demonstrated key capabilities during QT and proceeded to the CT. The Sandbox, Soldier Feedback Study and FBRR/LBRR will serve as risk reduction events for delayed thresholds and OT. The OT 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 OT will be designed to validate that HMS products meet warfighter needs in terms of effectiveness, suitability and survivability in an operationally realistic environment. Results from OT will facilitate the delivery orders for Full Rate Production.</p> <p>FY 2018 Plans: The FY 2018 funding is needed to conduct testing for the MP candidate products to demonstrate compliance with program requirements; assess effectiveness, suitability, and survivability; to obtain material release for FRP; engineering and technical support at test events; and to fully fund the testing requirements on the MP candidate radios as laid out in the HMS Acquisition Strategy approved May 2014.</p> <p>FY 2019 Plans:</p>		8.893	8.739	0.809

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
The FY 2019 funding is needed to conduct testing for the MP candidate products to demonstrate compliance with program requirements; assess effectiveness, suitability, and survivability; to obtain material release for FRP; engineering and technical support at test events; and to fully fund the testing requirements on the MP candidate radios as laid out in the HMS Acquisition Strategy approved May 2014.			
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> The decrease in requirement is a result of the radio reaching the end of operational testing while approaching full rate production.			
Accomplishments/Planned Programs Subtotals	10.347	10.039	1.959

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• FA2: <i>Rifleman Radio (RR)</i>	3.851	10.037	1.870	-	1.870	5.032	10.875	11.033	12.290	0.000	54.988
• B95006: <i>Handheld Radio</i>	43.734	37.773	79.802	-	79.802	102.959	92.940	95.091	92.653	0.000	544.952
• B95007: <i>Manpack Radio</i>	224.388	317.578	271.763	-	271.763	413.805	402.038	453.968	505.349	Continuing	Continuing

Remarks

D. Acquisition Strategy

Manpack Radio is currently executing a May 2014 approved acquisition strategy to procure Non-Developmental Items (NDI). Utilizing a full and open competition strategy the Manpack (MP) base contract was awarded to all potential industry partners. The MP contract was awarded on 26 February 2016, and will procure NDI MP radios for use in a classified environment. The MP is capable of running the following waveforms: SRW, Single Channel Ground and Airborne Radio System (SINCGARS), Satellite Communications (SATCOM) - Army managed waveforms, Mobile User Objective System (MUOS) - Navy managed waveform, and other advanced networking waveforms.

The Army has awarded Firm Fixed-Price (FFP) Indefinite Delivery Indefinite Quantity (IDIQ) Contracts and will procure radios through a multiple step selection process:

- a. Awarded FFP Contracts to all qualified vendors based on technical acceptability and demonstrations (26 February 2016)
- b. Awarded initial delivery orders based on Qualification Test results (19 December 2016)
- c. Awarded second delivery orders based on Customer Test results (31 July 2017)
- d. Award LRIP (4QFY18)
- d. Award FRP delivery orders based on best value trade off construct (3QFY19)

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support	Various	PEO C3T, CECOM, PM TR Alliant : Various; APG, MD	-	0.312	Dec 2016	0.600		0.450	Dec 2018	-		0.450	0.000	1.362	-
Subtotal			-	0.312		0.600		0.450		-		0.450	0.000	1.362	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
HMS Engineering/ Technical Support	Various	PEO C3T, ARL, ESP, CECOM, CERDEC, LCMC : Various	-	1.142	Jan 2017	0.700		0.700	Jan 2019	-		0.700	0.000	2.542	-
Subtotal			-	1.142		0.700		0.700		-		0.700	0.000	2.542	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Follow on Delta Development & Testing	RO	EPG : Ft. Huachuca	-	2.447	Dec 2016	-		-		-		-	0.000	2.447	-
Follow on Delta Development & Testing (2)	RO	OTC : TBD	-	6.446	Mar 2018	8.739		0.809	Nov 2018	-		0.809	0.000	15.994	-
Subtotal			-	8.893		8.739		0.809		-		0.809	0.000	18.441	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals		-	10.347	10.039	1.959	-	1.959	0.000	22.345	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Manpack (MP) Customer Test (CT)	[Redacted] MP CT																											
MP Sandbox and Soldier Feedback Study					[Redacted] MP Sandbox Event w/Soldier Feedback																							
MP Field/Lab Base Risk Reduction Test (FBRR/LBRR)					[Redacted] MP FBRR / LBRR																							
MP Operational Test (OT)					[Redacted] MP OT																							
MP LRIP					▲ 1 MP LRIP																							
MP Log Demo									■ MP Log Demo																			
MP Full Rate Production (FRP)									▲ 2 MP FRP																			
MP Performance Verification Test (PVT) (FY19)									■ MP PVT (FY19)																			
MP PVT (FY20)													■ MP PVT (FY20)															
MP PVT (FY21)																	■ MP PVT (FY21)											
MP PVT (FY22)																					■ MP PVT (FY22)							
MP PVT (FY23)																					■ MP PVT (FY23)							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA1 / <i>Manpack Radio</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Manpack (MP) Customer Test (CT)	2	2017	4	2017
MP Sandbox and Soldier Feedback Study	1	2018	2	2018
MP Field/Lab Base Risk Reduction Test (FBRR/LBRR)	3	2018	4	2018
MP Operational Test (OT)	4	2018	2	2019
MP LRIP	4	2018	4	2018
MP Log Demo	1	2019	1	2019
MP Full Rate Production (FRP)	3	2019	3	2019
MP Performance Verification Test (PVT) (FY19)	2	2019	2	2019
MP PVT (FY20)	3	2020	3	2020
MP PVT (FY21)	3	2021	3	2021
MP PVT (FY22)	3	2022	3	2022
MP PVT (FY23)	3	2023	3	2023

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA2 / <i>Rifleman Radio (RR)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
<i>FA2: Rifleman Radio (RR)</i>	-	3.851	10.037	1.870	-	1.870	5.032	10.875	11.033	12.290	0.000	54.988
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

HMS is structured as a single program of record. The HMS Handheld Radios encompass the one-channel Rifleman Radio (RR) and two-channel Leader Radio (LR). The RR is a handheld radio that connects soldiers at the lowest echelon of the Army network. It is a National Security Agency (NSA) certified Type 1 radio used for transmission of up to SECRET information. The RR provides one-channel secure voice and data communications using Soldier Radio Waveform (SRW). It is the primary squad level communication system. The LR is a Multiband two-channel handheld radio to be used at the Team, Squad, and Platoon level. The LR will simultaneously support Single Channel Ground and Airborne Radio System (SINCGARS) voice interoperability, SRW data and voice communications, and other advanced networking waveform communications, in one radio with both handheld and mounted configurations.

On 13 September 2016 the Army Acquisition Executive (AAE) approved a decreased Basis of Issue (BOI) for the single channel Rifleman Radio (RR), an increase to the BOI for the two channel Leader Radio (LR) and moving forward with acquisition activities for the two channel LR. Single channel RR procurement is being deferred.

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

	FY 2017	FY 2018	FY 2019
Title: Program Management	0.373	0.485	0.425
Description: Handheld's program management includes overall management of program execution, major events, reporting, funds execution, contract management, and logistical support. Includes participation in program planning and Integrated Product Team meetings.			
FY 2018 Plans: During this timeframe, will provide overall management and oversight to implement HMS acquisition strategy. Includes Core, Matrix, and Contractor support.			
FY 2019 Plans: During this timeframe, will provide overall management and oversight to implement HMS acquisition strategy. Includes Matrix and Contractor support.			
FY 2018 to FY 2019 Increase/Decrease Statement: The decrease in requirement is a result of the removal of Core support as this requirement will be covered with OMA funds starting in FY19.			
Title: HMS Engineering/Technical Support	0.154	0.300	0.300

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA2 / <i>Rifleman Radio (RR)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>Description: Overall technical analysis support to PdM HMS' Handheld products.</p> <p>FY 2018 Plans: Provide technical systems engineering support to evaluate technical alternatives and perform communication architecture analysis to identify alternatives to reduce cost, improve performance, and achieve tactical radio objectives. Technical test support for the planning and execution of laboratory and field test events, including support for testing of prototypes, Engineering Design Models (EDMs), commercial radio solutions, Developmental and Operational Test events, and data collection/reduction/analysis of tactical radio performance.</p> <p>FY 2019 Plans: Provide technical systems engineering support to evaluate technical alternatives and perform communication architecture analysis to identify alternatives to reduce cost, improve performance, and achieve tactical radio objectives. Technical test support for the planning and execution of laboratory and field test events, including support for testing of prototypes, Engineering Design Models (EDMs), commercial radio solutions, Developmental and Operational Test events, and data collection/reduction/analysis of tactical radio performance.</p>				
<p>Title: Test and Evaluation</p> <p>Description: Handheld's 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 Field / Lab Based Risk Reduction (FBRR/LBRR) that will serve as risk reduction events prior to Operational Test (OT) to ensure the radio is operational at full capability and ready to be used by soldiers.</p> <p>The QT will validate the manufacturers' ability to meet the minimum functional requirements identified in the Performance Requirements Document. Radios that successfully demonstrate key capabilities during QT will proceed to FBRR/LBRR. The OT 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 OT will be designed to validate that the HMS products meet warfighter needs in terms of effectiveness, suitability and survivability in an operationally realistic environment. Results from the OT will facilitate the delivery orders for Full Rate Production.</p> <p>FY 2018 Plans:</p>		3.324	9.252	1.145

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA2 / <i>Rifleman Radio (RR)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
The FY 2018 funding is needed to conduct testing for the LR candidate products to demonstrate compliance with program requirements; assess effectiveness, suitability, and survivability; to obtain material release for FRP; and to fund the testing requirements on the LR candidate radios as laid out in the HMS Acquisition Strategy addendum approved in March 2017.			
<i>FY 2019 Plans:</i> The FY 2019 funding is needed to conduct testing for the LR candidate products to demonstrate compliance with program requirements; assess effectiveness, suitability, and survivability; to obtain material release for FRP; and to fund the testing requirements on the LR candidate radios as laid out in the HMS Acquisition Strategy addendum approved in March 2017.			
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> The decrease in requirement is a result of the radio reaching the end of operational testing while approaching full rate production.			
Accomplishments/Planned Programs Subtotals	3.851	10.037	1.870

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• FA1: <i>Manpack Radio</i>	10.347	10.039	1.959	-	1.959	5.030	10.875	11.033	12.290	0.000	61.573
• B95006: <i>Handheld Radio</i>	43.734	37.773	79.802	-	79.802	102.959	92.940	95.091	92.653	0.000	544.952
• B95007: <i>Manpack Radio</i>	224.388	317.578	271.763	-	271.763	413.805	402.038	453.968	505.349	Continuing	Continuing

Remarks

D. Acquisition Strategy

On 13 September 2016 the Army Acquisition Executive (AAE) determined to decrease the Basis of Issue (BOI) for the single channel Rifleman Radio (RR), increase the BOI for the two channel Leader Radio (LR) and move forward with acquisition activities for the two channel LR. Single channel RR procurement is being deferred. An acquisition strategy addendum adding LR was approved in March 2017. The addendum continues the multi-vendor approach utilizing the existing IDIQ RR base contract (awarded 29 April 2015) and lessons learned to award the LR competitive contracts. The LR effort will be a separate competition under the Handheld radio suite. The Program Office released the solicitation for the two channel LR to support Qualification Testing Sept 2017. The Program Office will change the strategy to request objective capabilities, rather than the previous approach of low cost technically acceptable, and seek a best value effort to increase operational flexibility. Rifleman Radio Increment 2 (LR) Capability Production Document (CPD) was JROC approved on April 2017.

The LR will simultaneously run the Soldier Radio Waveform (SRW), or other advanced networking waveforms, and Single Channel Ground and Airborne Radio System (SINCGARS).

The Army will award Firm Fixed-Price (FFP) Indefinite Delivery Indefinite Quantity (IDIQ) Contracts and will procure radios through a multiple step selection process:

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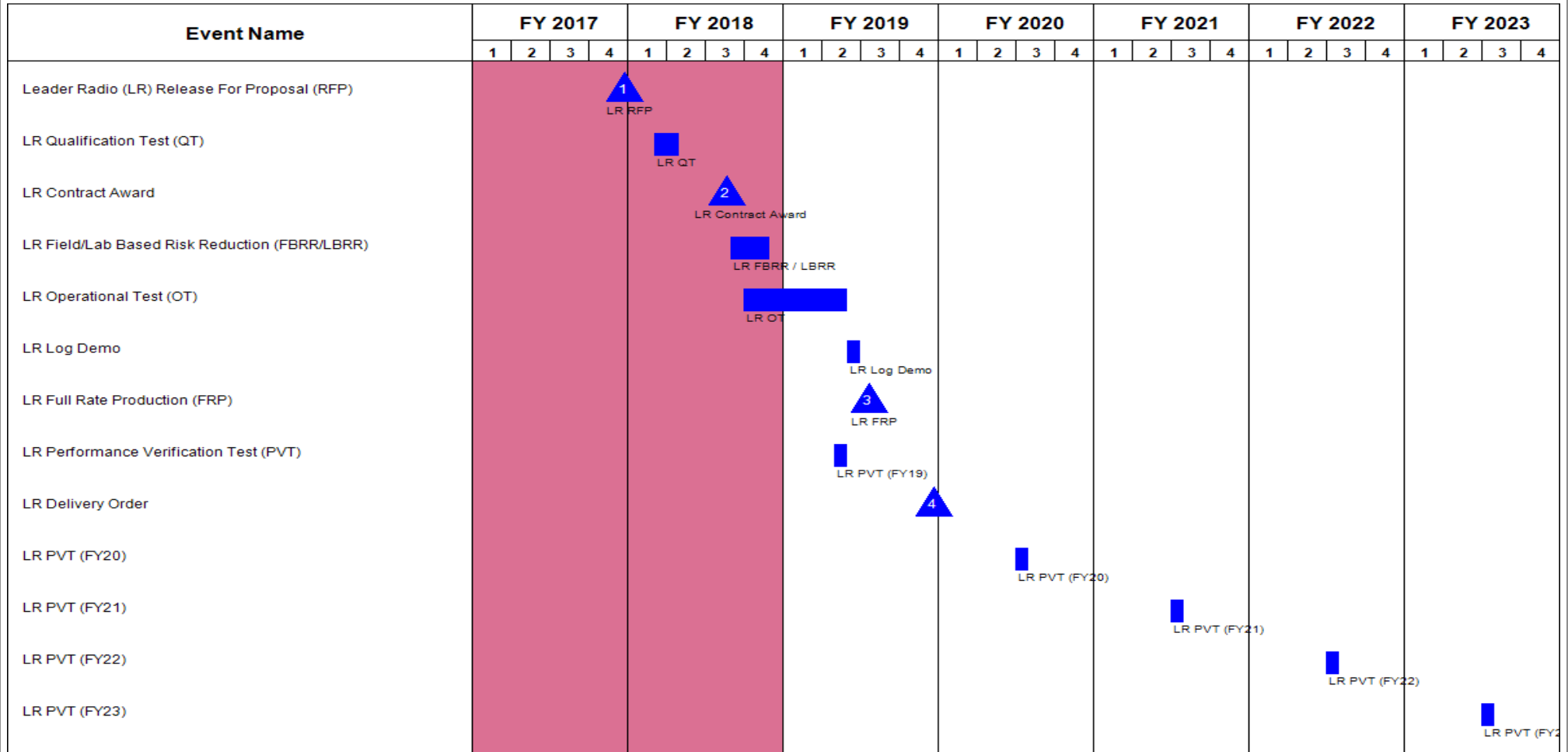
Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA2 / <i>Rifleman Radio (RR)</i>
a. Award FFP Contracts to all qualified vendors based on technical acceptability and demonstrations (3QFY18) b. Award initial delivery orders for FBRR/OT assets (3QFY18) c. Award FRP delivery orders based on Operational Test and best value trade off construct (3QFY19)		
E. Performance Metrics N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0605042A / Tactical Network Radio Systems (Low-Tier)				FA2 / Rifleman Radio (RR)								
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Project Management Office Support	Various	PEO C3T, CECOM, PM TR Alliant : Various; APG, MD	-	0.373	Dec 2016	0.485		0.425	Dec 2018	-		0.425	0.000	1.283	-	
Subtotal			-	0.373		0.485		0.425		-		0.425	0.000	1.283	N/A	
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
HMS Engineering/ Technical Support	Various	PEO C3T, ARL, ESP, CECOM, CERDEC, LCMC : Various	-	0.154	Jan 2017	0.300		0.300	Jan 2019	-		0.300	0.000	0.754	-	
Subtotal			-	0.154		0.300		0.300		-		0.300	0.000	0.754	N/A	
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Follow on Delta Development & Testing	RO	EPG : Fort Huachuca	-	2.676	Dec 2016	2.100		-		-		-	0.000	4.776	-	
Follow on Delta Development & Testing (2)	RO	OTC : TBD	-	0.648	Mar 2018	7.152		1.145	Nov 2018	-		1.145	0.000	8.945	-	
Subtotal			-	3.324		9.252		1.145		-		1.145	0.000	13.721	N/A	
Project Cost Totals			-	3.851		10.037		1.870		-		1.870	0.000	15.758	N/A	
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA2 / <i>Rifleman Radio (RR)</i>



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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / <i>Tactical Network Radio Systems (Low-Tier)</i>	Project (Number/Name) FA2 / <i>Rifleman Radio (RR)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Leader Radio (LR) Release For Proposal (RFP)	4	2017	4	2017
LR Qualification Test (QT)	1	2018	2	2018
LR Contract Award	3	2018	3	2018
LR Field/Lab Based Risk Reduction (FBRR/LBRR)	3	2018	4	2018
LR Operational Test (OT)	4	2018	2	2019
LR Log Demo	2	2019	2	2019
LR Full Rate Production (FRP)	3	2019	3	2019
LR Performance Verification Test (PVT)	2	2019	2	2019
LR Delivery Order	4	2019	4	2019
LR PVT (FY20)	3	2020	3	2020
LR PVT (FY21)	3	2021	3	2021
LR PVT (FY22)	3	2022	3	2022
LR PVT (FY23)	3	2023	3	2023

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605047A / <i>Army Contract Writing System</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	19.868	20.322	41.928	-	41.928	20.375	13.041	5.295	0.088	0.000	120.917
FA7: <i>Contract Writing System</i>	-	19.868	20.322	41.928	-	41.928	20.375	13.041	5.295	0.088	0.000	120.917

Note

Effective February 2, 2017 DoD Instruction (DoDI) 5000.75 was issued to establish policy for use of Business Capability Acquisition Cycle (BCAC) for Defense Business Systems, applying to Army Contract Writing System. This DoDI supersedes DoDI 5000.02, improving the alignment of business systems to commercial best practices as well as optimizing efficiencies and effectiveness across DoD for the acquisition of business systems. Decisions rendered by the Milestone Decision Authority, as outlined in DoDI 5000.75, are referred to as "Authority To Proceed (ATPs)" and replace DoDI 5000.02 "Milestones."

A. Mission Description and Budget Item Justification

The Army Contract Writing System (ACWS) will be the Army's single, next-generation, enterprise-wide contract writing, management, execution, and close-out software system. ACWS will facilitate the standardization of Army Procurement business processes and streamline the integration with Army Enterprise Resource Planning (ERP) systems. As a financial feeder system, ACWS will meet the compliance requirements of the Federal Financial Management Improvement Act of 1996 (FFMIA). The system will meet the full scope of Army Contracting requirements, including those in secure and non-secure locations, those supporting combat or non-combat contingencies, those within or outside the borders of the Continental United States, those supporting grants and assistance agreements, and those performing weapons systems, construction, installation, and other specialized contracting activities. This is consistent with Undersecretary of Defense, Acquisition, Technology and Logistics (USD(AT&L)) Memorandum; Department of Defense (DoD) Functional Contract Writing and Administration, dated 21 October 2011, which directed each of the Services to develop a new contract writing system. Accordingly, Army received an OSD Deputy Chief Management Officer (DCMO) validated problem statement and the Army Acquisition Executive approved the ACWS Materiel Development Decision (MDD) on 29 October 2014. On 24 March 2016, the USD(AT&L) signed the program's RFP Release Acquisition Decision Memorandum (ADM) which designated ACWS as an unbaselined, Major Automated Information System Acquisition Category IAM program, and approved the Army's request to release an RFP to industry to procure a Commercial-off-the-Shelf (COTS) system.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605047A / <i>Army Contract Writing System</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	20.663	20.322	28.227	-	28.227
Current President's Budget	19.868	20.322	41.928	-	41.928
Total Adjustments	-0.795	0.000	13.701	-	13.701
• Congressional General Reductions	-0.010	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.785	-			
• Adjustments to Budget Years	-	-	13.701	-	13.701

Change Summary Explanation

Following the selection of CGI Federal Inc. on 22 May 2017, ACWS was able to refine its schedule to reflect the SI's plan which achieves Full Deployment (FD) 20 months earlier than the Government's original initial plan (2 Releases vs 4 Releases) requiring funding earlier in the program. Required FY19 funding now supports all Release 1 software configuration, interface development, agile integrated testing, and preparing training and deployment teams in order to achieve Initial Operational Capability (IOC).

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605047A / Army Contract Writing System	Project (Number/Name) FA7 / Contract Writing System
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FA7: Contract Writing System	-	19.868	20.322	41.928	-	41.928	20.375	13.041	5.295	0.088	0.000	120.917
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Army Contract Writing System (ACWS) will be the Army's single, next-generation, enterprise-wide contract writing, management, execution, and close-out software system. ACWS will facilitate the standardization of Army Procurement business processes and streamline the integration with Army Enterprise Resource Planning (ERP) systems. As a financial feeder system, ACWS will meet the compliance requirements of the Federal Financial Management Improvement Act of 1996 (FFMIA). The system will meet the full scope of Army Contracting requirements, including those in secure and non-secure locations, those supporting combat or non-combat contingencies, those within or outside the borders of the Continental United States, those supporting grants and assistance agreements, and those performing weapons systems, construction, installation, and other specialized contracting activities. This is consistent with Undersecretary of Defense, Acquisition, Technology and Logistics (USD(AT&L)) Memorandum; Department of Defense (DoD) Functional Contract Writing and Administration, dated 21 October 2011, which directed each of the Services to develop a new contract writing system. Accordingly, Army received an OSD Deputy Chief Management Officer (DCMO) validated problem statement and the Army Acquisition Executive approved the ACWS Materiel Development Decision (MDD) on 29 October 2014. On 24 March 2016, the USD(AT&L) signed the program's RFP Release Acquisition Decision Memorandum (ADM) which designated ACWS as an unbaselined, Major Automated Information System Acquisition Category IAM program, and approved the Army's request to release an RFP to industry to procure a Commercial-off-the-Shelf (COTS) system.

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

	FY 2017	FY 2018	FY 2019
Title: Risk Reduction Activities	19.868	-	-
Description: The purpose of the Risk Reduction (RR) phase, is to fully assess the COTS solution procured as the results of the Full and Open Competition. The assessment will allow the program to award the initial development contract (Release 1) with a high degree of confidence that the program will successfully execute the development and deployment phase. RR will include several key activities conducted in parallel. First, the program will conduct Global Analysis and Business Blueprinting to optimize the To-Be, End-to-End, Procure-to-Pay processes and business scenarios. The program will define applicable Business Process Designs, identify any gaps between the COTS product and the ACWS requirements and determine how to resolve those gaps. This will all be done with the goal to align Army processes, as much as possible, to the COTS product processes. This will save significant development dollars. This phase will also include design of the required interfaces that are not included as part of the original COTS solution. The ultimate goal of this phase is to maintain the COTS baseline and reduce requirement for customization with a plan that allocates capabilities and interfaces across all software builds. The allocated baseline will be reviewed/ approved during a Preliminary Design Review.			
Title: Acquisition, Testing, and Deployment Phase	-	20.322	41.928

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605047A / Army Contract Writing System	Project (Number/Name) FA7 / Contract Writing System

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>Description: During the Development and Deployment Phase the program will perform all development, integration, test, and deployment activities for two software releases to achieve full deployment of ACWS capabilities to 10,000 end users in approximately 300 locations worldwide.</p> <p>FY 2018 Plans: FY 2018 funds will be used to continue business operations, Risk Reduction activities, and initial efforts for complex interface development. A significant amount of funding required to pay for TDY expenses of Army Contracting Experts to participate in Business Process Re-Engineering during Risk Reduction; for development of documentation associated with the program's Capability Implementation Plan; and preparation for the Authority to Proceed decision that will follow completion of risk reduction activities. The ACWS program will also be required to stand up a hosting environment(s) at a government-approved data center and pay the initial recurring hosting fees.</p> <p>FY 2019 Plans: FY 2019 funds will be used to complete the development of the first release and prepare training and deployment teams to deploy Release 1 capability to the Army Contracting Enterprise. Funds will also be used for production and integrated test environments for hosting at a government-approved data center.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: The increase in funds from FY 2018 to FY 2019 is due to the transition from Risk Reduction analysis efforts in FY18 to Release 1 capability configuration, interface development, testing, training, and preparation for deployment.</p>			
Accomplishments/Planned Programs Subtotals	19.868	20.322	41.928

C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• B66001: Contract Writing System	0.789	1.001	5.927	-	5.927	14.942	8.468	5.827	-	0.000	36.954

Remarks
FY 2019 base procurement funds procures requisite ACWS software licenses for Initial Operating Capability (IOC) (estimated delivery to 950 users for receiving Release 1 capability at IOC). The license procurement in FY 2019 supports pre-deployment activities including establishing both training and deployment teams for Release 1 which will be deployed in first quarter FY 2020. Funding also supports and system fielding activities (Organization Change Management) throughout the Acquisition, Testing, and Deployment Phase.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605047A / Army Contract Writing System	Project (Number/Name) FA7 / Contract Writing System

D. Acquisition Strategy

Through Full and Open Competition ACWS awarded a Single Award ID/IQ Contract with a 10-year ordering period to CGI Federal Inc. on 22 May 2017. Task Order 0001 of this contract is to conduct Risk Reduction activities concurrent with development of all regulatory and statutory documentation required. These activities are conducted for the purpose of meeting the USD AT&L timeline goals to sunset Standard Procurement System (SPS). Risk Reduction activities include Business Process Reengineering (BPR), Global Analysis, Blueprinting, and Interface Definition. Following Risk Reduction, ACWS will baseline the program at its next authority to proceed and will be in a position to begin the development of the initial software release interfaces (Release 1). The ACWS strategy consists of 2 software releases, followed by 60 months of sustainment activities during the Capability Support Phase.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605047A / Army Contract Writing System	Project (Number/Name) FA7 / Contract Writing System
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Office	Various	PdM ACWS : Arlington, VA	-	5.979	Oct 2016	7.260		7.819	Oct 2018	-		7.819	0.000	21.058	-
Subtotal			-	5.979		7.260		7.819		-		7.819	0.000	21.058	N/A

Remarks
FY19 projected costs include PMO contractor support labor, HW/SW tools, supplies, facility updates, and travel expenses.

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Product Development	Option/ Various	CGI Federal : Arlington, VA	-	13.889	May 2017	5.263		24.530	Oct 2018	-		24.530	0.000	43.682	-
Subtotal			-	13.889		5.263		24.530		-		24.530	0.000	43.682	N/A

Remarks
FY19 projected costs include all costs associated with SI Contract CLINs for TO 0002 and PMO costs related to product development.

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Hosting/Security/ Knowledge Management	IA	Dell/Virtustream On-Site Managed Services (OMS) Cloud Solution : DISA DECC Ogden	-	-		7.599		7.650	Oct 2018	-		7.650	0.000	15.249	-
Subtotal			-	-		7.599		7.650		-		7.650	0.000	15.249	N/A

Remarks
FY19 projected costs include IA/RMF activities, website development and management for PAM.mil, annual hosting and data maintenance management.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605047A / Army Contract Writing System	Project (Number/Name) FA7 / Contract Writing System
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			

Currently working with Unified Capabilities Development Branch at DISA and Virtustream on hosting our new application with the On-Site Managed Services (OMS) cloud solution inside DISA DECC Ogden (initial environments will be stood up in Q3 FY 2018).

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	ATEC : TBD	-	-		0.200		1.929	Oct 2018	-		1.929	0.000	2.129	-
Subtotal			-	-		0.200		1.929		-		1.929	0.000	2.129	N/A

Remarks
FY19 projected costs include T&E activities with ATEC and JTIC. SI Labor and Travel is included under Product Development (umbrella SI Contract).

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	19.868	20.322	41.928	-	41.928	0.000	82.118	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605047A / Army Contract Writing System	Project (Number/Name) FA7 / Contract Writing System

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ATP-1 (MS A) / Contract Award - Task Order 0001			▲ 1																									
Risk Reduction Activities			■																									
Acquisition, Testing, and Deployment Phase			■																									
Baseline ATP / Contract Award - Task Order 0002 Release 1							▲ 2																					
Contract Award - Task Order 0003 Release 2											▲ 3																	
Release 1 Limited User Test (LUT)													■															
IOC														▲ 4														
IOT&E																					■							
FD																									▲ 5			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605047A / Army Contract Writing System	Project (Number/Name) FA7 / Contract Writing System

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
ATP-1 (MS A) / Contract Award - Task Order 0001	3	2017	3	2017
Risk Reduction Activities	3	2017	3	2018
Acquisition, Testing, and Deployment Phase	3	2016	2	2022
Baseline ATP / Contract Award - Task Order 0002 Release 1	3	2018	3	2018
Contract Award - Task Order 0003 Release 2	1	2019	1	2019
Release 1 Limited User Test (LUT)	1	2020	1	2020
IOC	1	2020	1	2020
IOT&E	2	2022	2	2022
FD	2	2022	2	2022

Note
The ACWS program is requesting a "Baseline ATP" to fulfill MS B requirements not yet completed.

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0605049A / Missile Warning System Modernization (MWSM)
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	55.810	28.276	-	28.276	90.129	107.136	77.345	116.670	0.000	475.366
XT4: Advanced Threat Detection System (ATDS)	-	0.000	55.810	28.276	-	28.276	90.129	107.136	77.345	116.670	0.000	475.366

A. Mission Description and Budget Item Justification

Advanced Threat Detection Systems (ATDS) is anticipated to be an ACAT I program. It is the next generation fleet-wide threat detection component to the Aircraft Survivability Equipment suite. ATDS will replace the Common Missile Warning System (CMWS). Primary capability achieved through ATDS is the agility necessary to rapidly react to evolving threats.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	55.810	31.823	-	31.823
Current President's Budget	0.000	55.810	28.276	-	28.276
Total Adjustments	0.000	0.000	-3.547	-	-3.547
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-3.547	-	-3.547

Change Summary Explanation

FY19 base funding was decreased to align with program requirements.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605049A / <i>Missile Warning System Modernization (MWSM)</i>				Project (Number/Name) XT4 / <i>Advanced Threat Detection System (ATDS)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
XT4: <i>Advanced Threat Detection System (ATDS)</i>	-	0.000	55.810	28.276	-	28.276	90.129	107.136	77.345	116.670	0.000	475.366
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY19 base funding was decreased to align with program requirements.

A. Mission Description and Budget Item Justification

Advanced Threat Detection Systems (ATDS) is anticipated to be an ACAT I program. It is the next generation fleet-wide threat detection component to the Aircraft Survivability Equipment suite. ATDS will replace the Common Missile Warning System (CMWS). Primary capability achieved through ATDS is the agility necessary to rapidly react to evolving threats.

Justification:

FY 2019 Base Research Development Test and Evaluation (RDTE) dollars in the amount of \$28.580 million fund system development, sensor infrastructure, & algorithm analysis, system engineering program management, and engineering support for an advanced missile warning system.

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

	FY 2017	FY 2018	FY 2019
Title: ATDS	-	55.810	28.276
Description: Develop, test, integrate, and field an advanced missile warning system.			
FY 2018 Plans: FY 2018 Base RDTE dollars in the amount of \$55.810 million will fund development to include resources to support systems test and evaluation (ST&E) and program planning for an advanced missile warning system.			
FY 2019 Plans: FY 2019 Base RDTE dollars in the amount of \$28.276 million will fund development to include resources to support management services, product development, support, and test & evaluation for an advanced missile warning system.			
FY 2018 to FY 2019 Increase/Decrease Statement: ATDS is pre-MDD. Program funding will require adjustments based on approved program timeline and material solution.			
Accomplishments/Planned Programs Subtotals			
	-	55.810	28.276

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605049A / <i>Missile Warning System Modernization (MWSM)</i>	Project (Number/Name) XT4 / <i>Advanced Threat Detection System (ATDS)</i>

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

N/A

Remarks

D. Acquisition Strategy

Due to the anticipated proliferation of unexploited threat weapon systems and technically advanced threat weapon systems, the Army requires a Universal Threat Detection (UTD) capability to protect aviation platforms and aircrews on the future battlefield. ATDS is the Army's next generation missile warning system intended to improve individual aircraft survivability against advanced IR homing missiles. ATDS will be a fleet-wide replacement for CMWS. ATDS will provide enhanced missile warning capabilities for Army rotary-wing, small fixed wing and tilt-rotor platforms and Special Operations rotary wing aircraft.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0605049A / Missile Warning System Modernization (MWSM)				XT4 / Advanced Threat Detection System (ATDS)								
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Systems Engineering Program Management - SEPM	TBD	PM ASE : HSV, AL	-	-		1.550		2.486	Jan 2019	-		2.486	0.000	4.036	Continuing	
Systems Engineering Program Management - Other	Various	Various : PM ASE, HSV, AL	-	-		-		2.739	Jan 2019	-		2.739	0.000	2.739	-	
Subtotal			-	-		1.550		5.225		-		5.225	0.000	6.775	N/A	
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
ST&E Development Engineering	TBD	PM ASE : HSV, AL	-	-		14.774		12.157	Mar 2019	-		12.157	0.000	26.931	Continuing	
Software for ST&E	TBD	PM ASE : HSV, AL	-	-		7.930		2.125	Mar 2019	-		2.125	0.000	10.055	Continuing	
Software Development	Various	Various : PM ASE, HSV, AL	-	-		-		2.164	Mar 2019	-		2.164	0.000	2.164	-	
Subtotal			-	-		22.704		16.446		-		16.446	0.000	39.150	N/A	
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Matrix Support	TBD	PM ASE : HSV, AL	-	-		3.840		5.192	Jan 2019	-		5.192	0.000	9.032	Continuing	
Subtotal			-	-		3.840		5.192		-		5.192	0.000	9.032	N/A	

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605049A / <i>Missile Warning System Modernization (MWSM)</i>	Project (Number/Name) XT4 / <i>Advanced Threat Detection System (ATDS)</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Material Development Decision					▲ 1																							
Material Solution Analysis Phase																												
Milestone A																												
Technology Maturation and Risk Reduction Phase																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605049A / <i>Missile Warning System Modernization (MWSM)</i>	Project (Number/Name) XT4 / <i>Advanced Threat Detection System (ATDS)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Material Development Decision	2	2018	2	2018
Material Solution Analysis Phase	1	2018	4	2020
Milestone A	4	2020	4	2020
Technology Maturation and Risk Reduction Phase	1	2021	4	2023

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605051A / <i>Aircraft Survivability Development</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	121.530	60.979	21.965	34.933	56.898	22.712	10.456	14.548	18.823	0.000	305.946
ER7: <i>Aircraft Survivability Equipment Development</i>	-	16.168	26.165	16.163	-	16.163	16.894	5.327	7.752	11.896	0.000	100.365
ER8: <i>Common Missile Warning System (CMWS)</i>	-	105.362	34.814	5.802	34.933	40.735	5.818	5.129	6.796	6.927	0.000	205.581

A. Mission Description and Budget Item Justification

The Aircraft Survivability Development budget line includes Aircraft Survivability Equipment Development (ER7) and Common Missile Warning System (ER8). This budget line also includes funding for Joint Urgent Operational Needs Statement (JUONS) SO-0010 Phase 2a, Headquarters Department of the Army (HQDA) Directed Requirement for the Advanced Threat Warner (ATW) portion of the ATW/ Common Infrared Countermeasures Quick Reaction Capability (ATW/CIRCM QRC), and the next generation missile warning system.

ER7: Aircraft Survivability Development.

The objective of the Aircraft Survivability Equipment (ASE) Development project is to improve Radio Frequency (RF) ASE for Army aviation. The APR-39 Radar Warning Receiver (RWR) detects, categorizes, and prioritizes RF emitters and provides a visual / aural alert to aircrew members warning them of targeting by RF-guided weapons. The Milestone Decision Authority (MDA) approved Phases 1 and 2 of a 3-phased path forward.

Phase 1 serves as an obsolescence / sustainment upgrade to the Processor Line Replaceable Unit (LRU) of the AN/APR-39A(V) RWR implemented to ensure that the currently fielded system remains viable until an affordable improved RF ASE capability can be pursued in Phases 2 and 3.

Phase 2 RWR Modernization begins by adopting the United States Navy APR-39D(V)2 system. APR-39D(V)2 will significantly improve the RF threat coverage, automatic detection and identification of threat types, bearing, and lethality. This phase ends upon completion of the Modernized RWR (MRWR) which is an ECP to the APR-39D(V)2 that will implement enhanced hardware upgrades to keep the APR-39D(V)2 technically relevant against agile threats.

Phase 3 adds active Electronic Countermeasures (ECM) jamming capability for selected aircraft; Materiel Development Decision (MDD) for this ECM jamming capability phase is not expected until later in the Future Years Defense Program (FYDP).

Justification: Fiscal Year (FY) 2019 Base RDT&E funding of \$16.163 million supports MRWR development.

ER8: Common Missile Warning System (CMWS).

The US Army operational requirements concept for Aviation Infrared (IR) countermeasure systems is known as the Suite of Integrated Infrared Countermeasures (SIIRCM). SIIRCM is an integrated warning and countermeasure system to enhance aircraft survivability against IR-guided threat missile systems. The CMWS is a core

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605051A / <i>Aircraft Survivability Development</i>	
<p>element of the SIIRCM concept. CMWS is an integrated ultraviolet (UV) missile warning system, with an Improved Countermeasure Dispenser (ICMD) serving as a subsystem to a host aircraft.</p> <p>The CMWS program is a UV missile warning system that cues both flare and laser-based countermeasures to defeat incoming IR-seeking missiles and will alert aircrews to the presence of certain incoming unguided munitions. The B-Kit consists of the components which perform the missile detection and aircrew notification, unguided munitions detection and aircrew notification, false alarm rejection, and countermeasure employment/cueing functions of the system. The CMWS Electronic Control Unit (ECU) receives UV missile detection data from Electro-Optic Missile Sensors (EOMS) and sends a missile alert signal to warn aircrews via on-board avionics. Tier 1 threat missiles detected and tracked by the CMWS are subsequently defeated by a combination of missile seeker countermeasures, including decoy flares and IR Laser Jamming (currently Advanced Threat Infrared Countermeasures (ATIRCM)-equipped CH-47 platform only). In addition, the CMWS ECU receives from the EOMS unguided munitions detection data which it also passes to the aircrew through aural and visual alerts. The aircrew then applies the appropriate Tactics, Techniques and Procedures (TTPs) to break contact or engage the enemy with own-ship ordnance. The CMWS Generation 3 (Gen 3) ECU in conjunction with ongoing software development efforts will address outstanding materiel release conditions to achieve a Full Materiel Release (FMR) for CMWS and ensure protection against emerging IR-guided missile threats.</p> <p>The A-Kit for CMWS includes mounting hardware, wiring harnesses, cables, and other components necessary to install and interface the mission kit on host aircraft. The A-Kit ensures the mission kit is functionally and physically operational with a specific host aircraft type.</p> <p>Phase 2a DoN LAIRCM (JUONS S0-0010) and Phase 3 ATW/CIRCM QRC Initially, a select number of aircraft in the threat area of responsibility will be outfitted with the Phase 2a Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system. However, this approach came with a Space, Weight and Power - Cooling (SWaP-C) penalty which is being addressed as a follow-on JUONS solution requirement using the Phase 3 Advanced Threat Warner (ATW) / Common Infrared Countermeasure (CIRCM) Quick Reaction Capability (QRC). The intent of the Phase 3 ATW/CIRCM QRC effort is to reduce the SWaP-C associated with the Phase 2a solution.</p> <p>Phase 4 Limited Interim Missile Warning System (LIMWS) QRC The Phase 4 LIMWS QRC effort is a follow-on bridging solution to the JUONS SO-0010 to fill a global capability gap until the Advanced Threat Detection System (ATDS) Program of Record is fielded. The LIMWS QRC effort provides advance missile detection capability to an increased number of aircraft outside of the Phase 2a and Phase 3 efforts areas of responsibility.</p> <p>Justification: CMWS: FY 2019 Base Research, Development, Test, and Evaluation (RDTE) dollars in the amount of \$5.802 million fund development engineering of the Threat Analysis Database (TAD), future sensor & algorithm analysis, vulnerability analysis and assessment of technologies (VAAT), and Systems Engineering Process Management (SEPM).</p> <p>Phase 3 Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW & CIRCM QRC): FY 2019 Overseas Contingency Operations (OCO) RDTE dollars in the amount of \$5.110 million fund System Test & Evaluation (ST&E) and tech manual development.</p>		

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605051A / <i>Aircraft Survivability Development</i>
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Phase 4 Limited Interim Missile Warning System (LIMWS): FY19 Overseas Contingency Operations (OCO) RDTE dollars in the amount of \$29.823 million are estimated to fund test of system and design for lead platform and development of follow-on platform designs.

Joint Staff, J-8 Deputy Director for Requirements (DOR) memorandum, April 24, 2015

Phase 2a SOCOM JUONs S0-0010, Joint Rapid Acquisition Cell (JRAC) memorandum, May 29, 2015

Directed Requirement for the Phase 3 Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW & CIRCM QRC) to Support Joint Urgent Operational Need (JUON) S0-0010, CIRCM Critical Intelligence Parameters Breach, December 18, 2015

Directed Requirement for the Phase 4 Limited Interim Missile Warning System (LIMWS) QRC, March 26, 2017

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	124.243	60.979	10.362	-	10.362
Current President's Budget	121.530	60.979	21.965	34.933	56.898
Total Adjustments	-2.713	0.000	11.603	34.933	46.536
• Congressional General Reductions	-0.016	-			
• Congressional Directed Reductions	-7.000	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.297	-			
• Adjustments to Budget Years	-	-	11.603	34.933	46.536
• Other Adjustments 1	-10.000	-	-	-	-
• Other Adjustments 2	15.600	-	-	-	-

Change Summary Explanation

FY17 adjustment of \$15,600 is OCO funding added for LIMWS

FY19 Adjustment of \$11.603 adds funding for ER7 and ER8 Product Development

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development				Project (Number/Name) ER7 / Aircraft Survivability Equipment Development			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ER7: Aircraft Survivability Equipment Development	-	16.168	26.165	16.163	-	16.163	16.894	5.327	7.752	11.896	0.000	100.365
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The objective of the Aircraft Survivability Equipment (ASE) Development project is to improve Radio Frequency (RF) ASE for Army aviation. The APR-39 Radar Warning Receiver (RWR) detects, categorizes, and prioritizes RF emitters and provides a visual / aural alert to aircrew members warning them of targeting by RF-guided weapons. The Milestone Decision Authority (MDA) approved Phases 1 and 2 of a 3-phased path forward.

Phase 1 serves as an obsolescence / sustainment upgrade to the Processor Line Replaceable Unit (LRU) of the AN/APR-39A(V) RWR implemented to ensure that the currently fielded system remains viable until affordable improved RF ASE capability can be pursued in Phases 2 and 3.

Phase 2 RWR Modernization begins by adopting the United States Navy APR-39D(V)2 system. APR-39D(V)2 will significantly improve the RF threat coverage, automatic detection and identification of threat types, bearing, and lethality. This phase ends upon completion of the Modernized RWR (MRWR) which is an ECP to the APR-39D(V)2 that will implement enhanced hardware upgrades to keep the APR-39D(V)2 technically relevant against agile threats.

Phase 3 adds active Electronic Countermeasures (ECM) jamming capability for selected aircraft; Materiel Development Decision (MDD) for this ECM jamming capability phase is not expected until later in the Future Years Defense Program (FYDP).

Justification: Fiscal Year (FY) 2019 Base RDT&E funding of \$16.337 million supports MRWR development.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Phase 2 Radio Frequency Countermeasure (CM)	16.168	26.165	16.163	-	16.163
Description: Phase 2 RWR Modernization					
FY 2018 Plans: Will fund software improvement and ECP development, platform integration, Government Test and Evaluation and Support/Management services.					
FY 2019 Base Plans: Will fund MRWR hardware and software development.					
FY 2018 to FY 2019 Increase/Decrease Statement:					

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER7 / Aircraft Survivability Equipment Development
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Fiscal Year (FY) 2018 Base RDT&E funding of \$26.165 million supports MRWR development. FY 2019 Base RDT&E funding of \$16.163 million supports MRWR development.					
Accomplishments/Planned Programs Subtotals	16.168	26.165	16.163	-	16.163

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• AZ3511: Radio Frequency CM (AZ3511)	72.425	57.743	51.135	-	51.135	103.639	86.092	93.254	161.244	Continuing	Continuing

Remarks

D. Acquisition Strategy

Army RF ASE is managed by Project Manager ASE (PM ASE) for development, testing, procurement, integration and installation on Army rotary wing and small fixed wing aviation platforms. PM ASE proposed a three-phased path forward commensurate with user priorities and affordability considerations. The Milestone Decision Authority (MDA) approved Phases 1 and 2 of a 3-phased path forward.

Phase 1 addresses obsolescence/Diminishing Manufacturing Sources (DMS) issues associated with the currently fielded AN/APR-39A(V) RWR via sole source ECP awarded to the APR-39A manufacturer.

Phase 2 adopts the United States Navy (USN) APR-39D(V)2 system, limiting service-unique design, test, and integration expenses. Adoption of the APR-39D(V)2 in limited quantity, followed by development, testing, procurement, and fielding of the Modernized RWR (MRWR) will address the significant RF capability gap while avoiding additional up-front costs associated with a single-Service solution.

Phase 3 will develop and integrate active Electronic Countermeasures jamming capability for select aircraft.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605051A / Aircraft Survivability Development				ER7 / Aircraft Survivability Equipment Development							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Threat Management	Various	Various : -	8.839	-		0.284		-		-		-	Continuing	Continuing	Continuing
Project Management	Various	Various : -	0.429	1.166		0.258		-		-		-	Continuing	Continuing	Continuing
Subtotal			9.268	1.166		0.542		-		-		-	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Digital Radar Warning Receiver (RWR) (D(V)2)	Various	Lab Demo / Study : Various	10.634	-		-		-		-		-	Continuing	Continuing	Continuing
H/W & S/W Development	Various	OGA : Aberdeen Proving Grounds, MD	3.037	7.099	Feb 2017	23.955	Apr 2018	16.163	Dec 2018	-		16.163	Continuing	Continuing	Continuing
SIL Updates	MIPR	I2WD : Aberdeen Proving Grounds, MD	1.726	0.821	Jan 2017	-		-		-		-	Continuing	Continuing	Continuing
Depot Standup	MIPR	Tobyhanna : Tobyhanna, PA	1.052	0.011		-		-		-		-	0.000	1.063	-
Platform Integration	Various	Multiple : -	4.516	-		0.036		-		-		-	Continuing	Continuing	Continuing
Subtotal			20.965	7.931		23.991		16.163		-		16.163	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Support	Various	Various : -	3.132	1.050		0.503		-		-		-	Continuing	Continuing	Continuing
Matrix Support	Various	Various : -	6.800	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			9.932	1.050		0.503		-		-		-	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army Date: February 2018

Appropriation/Budget Activity 2040 / 5 R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development Project (Number/Name) ER7 / Aircraft Survivability Equipment Development

Table with columns: Test and Evaluation (\$ in Millions), FY 2017, FY 2018, FY 2019 Base, FY 2019 OCO, FY 2019 Total, Cost To Complete, Total Cost, Target Value of Contract. Rows include Multi-Service DT/OT, Government System Test and Evaluation, and Project Cost Totals.

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER7 / Aircraft Survivability Equipment Development

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Phase 2 APR-39D(V)2 DT/OT	██████████																											
Phase 2 APR-39D(V)2 Initial Procurement Cut-In					▲ 1																							
Phase 2 APR-39D(V)2 Procurement/Deployment									██████████				██████████				██████████				██████████							
Phase 2 APR-39D(V)2 FUE									▲ 2																			
Emerging Threats/SIL Updates	██████████				██████████				██████████				██████████				██████████				██████████							
Software Development	██████████				██████████				██████████				██████████				██████████				██████████							
Phase 2 APR-39D(V)2 Procurement Transition									▲ 3																			
MRWR Software and Hardware Development																					██████████							
MRWR DT/OT																					██████████							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER7 / Aircraft Survivability Equipment Development

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Phase 2 APR-39D(V)2 Army Design Requirements Insertion	3	2013	2	2014
Phase 2 APR-39D(V)2 Prototype Fabrication	4	2013	2	2015
Phase 2 APR-39D(V)2 DT/OT	3	2016	4	2017
Phase 2 APR-39D(V)2 Platform Integration	1	2014	3	2016
Phase 2 APR-39D(V)2 Initial Procurement Cut-In	4	2017	4	2017
Phase 2 APR-39D(V)2 Procurement/Deployment	4	2017	4	2023
Phase 2 APR-39D(V)2 FUE	4	2018	4	2018
Emerging Threats/SIL Updates	3	2016	4	2023
Software Development	1	2015	4	2023
Phase 2 APR-39D(V)2 Procurement Transition	4	2019	4	2019
MRWR Software and Hardware Development	2	2022	3	2026
MRWR DT/OT	2	2022	2	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development				Project (Number/Name) ER8 / Common Missile Warning System (CMWS)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ER8: <i>Common Missile Warning System (CMWS)</i>	-	105.362	34.814	5.802	34.933	40.735	5.818	5.129	6.796	6.927	0.000	205.581
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The US Army operational requirements concept for Aviation Infrared (IR) countermeasure systems is known as the Suite of Integrated Infrared Countermeasures (SIIRCM). SIIRCM is an integrated warning and countermeasure system to enhance aircraft survivability against IR-guided threat missile systems. The CMWS is a core element of the SIIRCM concept. CMWS is an integrated ultraviolet (UV) missile warning system, with an Improved Countermeasure Dispenser (ICMD) serving as a subsystem to a host aircraft.

The CMWS program is a UV missile warning system that cues both flare and laser-based countermeasures to defeat incoming IR-seeking missiles and will alert aircrews to the presence of certain incoming unguided munitions. The B-Kit consists of the components which perform the missile detection and aircrew notification, unguided munitions detection and aircrew notification, false alarm rejection, and countermeasure employment/cueing functions of the system. The CMWS Electronic Control Unit (ECU) receives UV missile detection data from Electro-Optic Missile Sensors (EOMS) and sends a missile alert signal to warn aircrews via on-board avionics. Tier 1 threat missiles detected and tracked by the CMWS are subsequently defeated by a combination of missile seeker countermeasures, including decoy flares and IR Laser Jamming (currently Advanced Threat Infrared Countermeasures (ATIRCM)-equipped CH-47 platform only). In addition, the CMWS ECU receives from the EOMS unguided munitions detection data which it also passes to the aircrew through aural and visual alerts. The aircrew then applies the appropriate Tactics, Techniques and Procedures (TTPs) to break contact or engage the enemy with own-ship ordnance. The CMWS Generation 3 (Gen 3) ECU in conjunction with ongoing software development efforts will address outstanding materiel release conditions to achieve a Full Materiel Release (FMR) for CMWS and ensure protection against emerging IR-guided missile threats.

The A-Kit for CMWS includes mounting hardware, wiring harnesses, cables, and other components necessary to install and interface the mission kit on host aircraft. The A-Kit ensures the mission kit is functionally and physically operational with a specific host aircraft type.

Phase 2a DoN LAIRCM (JUONS S0-0010) and Phase 3 ATW & CIRCM QRC Initially, a select number of aircraft in the threat area of responsibility will be outfitted with the Phase 2a Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system. However, this approach came with a Space, Weight and Power - Cooling (SWaP-C) penalty which is being addressed as a follow-on JUONS solution requirement using the Phase 3 Advanced Threat Warner (ATW) and Common Infrared Countermeasure (CIRCM) Quick Reaction Capability (QRC). The intent of the Phase 3 ATW & CIRCM QRC effort is to reduce the SWaP-C associated with the Phase 2a solution.

Phase 4 Limited Interim Missile Warning System (LIMWS) QRC The Phase 4 LIMWS QRC effort is a follow-on bridging solution to the JUONS SO-0010 to fill a global capability gap until the Advanced Threat Detection System (ATDS) Program of Record is fielded. The LIMWS QRC effort provides advance missile detection capability to an increased number of aircraft outside of the Phase 2a and Phase 3 efforts areas of responsibility.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER8 / Common Missile Warning System (CMWS)

Justification:
 CMWS: FY 2019 Base Research, Development, Test, and Evaluation (RDTE) dollars in the amount of \$5.802 million fund development engineering of the Threat Analysis Database (TAD), future sensor & algorithm analysis, vulnerability analysis and assessment of technologies (VAAT) and Systems Engineering Project Management (SEPM).

Phase 3 ATW & CIRCM QRC: FY 2019 Overseas Contingency Operations (OCO) RDTE dollars in the amount of \$5.110 million will fund System Test & Evaluation (ST&E), technical manual development, and integration efforts to support the Phase 3 Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW & CIRCM QRC) efforts.

Phase 4 Limited Interim Missile Warning System (LIMWS) QRC : FY19 Overseas Contingency Operations (OCO) RDTE dollars in the amount 29.823 million are estimated to fund test of system and design for lead platform and development of follow-on platform designs.

Joint Staff, J-8 Deputy Director for Requirements (DOR) memorandum, April 24, 2015
 Phase 2a SOCOM JUONs S0-0010, Joint Rapid Acquisition Cell (JRAC) memorandum, May 29, 2015
 Directed Requirement for the Phase 3 Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW & CIRCM QRC) to Support Joint Urgent Operational Need (JUON) S0-0010, CIRCM Critical Intelligence Parameters Breach, December 18, 2015
 Directed Requirement for the Phase 4 Limited Interim Missile Warning System (LIMWS) QRC, March 26, 2017

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: CMWS Product Development and Management Services	4.152	4.714	5.802	-	5.802
Description: RDTE funding supports continuing development engineering of the TAD, salaries, and integration with other ASE Systems.					
FY 2018 Plans: FY 2018 Base RDTE dollars in the amount of \$4.714 million will fund Product Development - TAD and Future Sensor and Algorithm Analysis; and Management Services - CMWS Systems Engineering Program Management.					
FY 2019 Base Plans: FY 2019 Base RDTE dollars in the amount of \$5.802 million will fund Product Development - Threat Analysis Detection (TAD), Future Sensor and Algorithm Analysis, and Vulnerability Analysis and Assessment of Technologies (VAAT); Management Services - CMWS Systems Engineering Program Management.					
FY 2018 to FY 2019 Increase/Decrease Statement:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army				Date: February 2018	
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER8 / Common Missile Warning System (CMWS)			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funding increase is due to current approved allocation of funds in FY19.					
Title: JUONS SO-0010 Phase 2a OCO Description: JUONS Phase 2a will integrate the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system on a select number of aircraft in the threat area of responsibility.	11.410	-	-	-	-
Title: Phase 3 ATW /CIRCM QRC OCO Description: Phase 3 ATW/CIRCM QRC will displace JUONS Phase 2a to achieve reduction in SWaP. FY 2018 Plans: There is no FY18 Base funding for this effort. FY 2019 Base Plans: There is no FY19 Base funding for this effort. FY 2019 OCO Plans: Phase 3 Advanced Threat Warner and Common Infrared Countermeasure Quick Reaction Capability (ATW & CIRCM QRC): FY 2019 Overseas Contingency Operations (OCO) RDTE dollars in the amount of \$5.110 million will fund System Test & Evaluation (ST&E) and technical manual development, and integration efforts to support the Phase 3 ATW & CIRCM QRC efforts. FY 2018 to FY 2019 Increase/Decrease Statement: Funding decrease due to product transitioning from development phase to the production phase.	56.066	30.100	0.000	5.110	5.110
Title: Phase 4 LIMWS QRC Description: Phase 4 Limited Interim Missile Warning System (LIMWS) is a follow-on bridging solution to the JUONS SO-0010 to fill a global capability gap until the Advanced Threat Detection System (ATDS) Program of Record is fielded. LIMWS is a Chief of Staff of the Army approved Directed Requirement issued by Army G-8 on 26 Mar 2017. LIMWS QRC provides an enhanced missile warning system to detect emerging and evolving enemy Man Portable Air Defense Systems (MANPADS) threats. FY19 funding is required to complete system development and conduct integration and system level testing as well as develop and test platform specific hardware (A-kits) for integration of the LIMWS system onto Army aircraft. FY 2019 Base Plans:	33.734	-	0.000	29.823	29.823

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER8 / Common Missile Warning System (CMWS)
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
There is no FY19 Base funding for this effort.					
<i>FY 2019 OCO Plans:</i> FY2019 Overseas Contingency Operations (OCO) RDTE dollars in the amount of \$29.823 million are estimated to fund test of system and design for lead platform and development of follow-on platform designs.					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding increase due to first year of funding on PE 0605051A - ER8 for Phase 4 LIMWS QRC is FY19.					
Accomplishments/Planned Programs Subtotals	105.362	34.814	5.802	34.933	40.735

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• AZ3517: CMWS	97.741	166.567	13.496	84.387	97.883	14.077	10.645	10.110	8.325	0.000	405.348

Remarks

D. Acquisition Strategy
 CMWS: The acquisition strategy includes buying CMWS B-Kits to support fielding requirements and installation of A-Kits on all modernized aircraft. The previous CMWS production contract was a firm fixed-priced (FFP), Indefinite Delivery, Indefinite Quantity (IDIQ) contract. A FFP bridge contract was awarded March 2013 for CMWS hardware. The follow-on CMWS production FFP/Cost Plus Fixed Fee (CPFF) IDIQ contract is a 3 year firm fixed price contract to procure the remaining Generation 3 Electronic Control Unit (ECU) and A-Kits and was awarded SEP 2013. The Gen 3 ECU, which provides increased processing capacity and enables unguided munitions detection, became a part of the system in FY 2010; First Unit Equipped (FUE) for the Gen 3 ECU was achieved in Operation Enduring Freedom (OEF) on 18 September 2013. All aircraft deployed to OEF have received the new processor with hostile fire detection capability. Gen 3 ECUs will gradually replace all Gen 2 ECUs across the Aviation fleet between now and 2018.

JUONS Phase 2a DoN LAIRCM and Phase 3 ATW & CIRCM QRC: JUONS S0-0010 acquisition strategy includes aircraft prime contractor engineering support contracted to a Government test organization. Aircraft integration for JUONS will be handled through government operated organizations and industry partners.

Phase 4 Limited Interim Missile Warning System (LIMWS) QRC: Acquisition strategy includes a full and open competition for selection of prime vendor for development of B-Kit and development of A-Kit and support testing for the lead program. Additional platform A-Kit development will be handled by government organizations and industry partners.

E. Performance Metrics
 N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER8 / Common Missile Warning System (CMWS)
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
CMWS Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	8.139	0.415		0.370		0.586	Jan 2019	-		0.586	Continuing	Continuing	Continuing
Advanced Missile Warning System Systems Engineering Program Management	TBD	TBD : TBD	-	2.000		-		-		-		-	0.000	2.000	-
JUONS SO-0010 Phase 2a Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	0.317	1.310		-		-		-		-	0.000	1.627	-
ATW & CIRCM QRC Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	1.600	5.544		1.000		-		-		-	Continuing	Continuing	Continuing
LIMWS - SEPM	Various	Various : PM ASE, HSV, AL	-	5.634		-		0.000		0.489	Jan 2019	0.489	0.000	6.123	-
Subtotal			10.056	14.903		1.370		0.586		0.489		1.075	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
CMWS tier 2/3 Upgrades	Various	Various : -	2.000	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Threat Analysis Database Design	Various	BAE : Various	0.455	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Threat Analysis Database (TAD)	Various	BAE : Various	3.417	2.702		2.188		1.910	Mar 2019	-		1.910	Continuing	Continuing	Continuing
CMWS Enhanced Sensor Study & Evaluation	Various	Various : -	11.466	-		-		-		-		-	0.000	11.466	-
CMWS Data Modeling	TBD	Various : Various	0.688	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Future Sensor and Algorithm Analysis	Various	Various : TBD	-	1.035		2.156		1.938	Mar 2019	-		1.938	Continuing	Continuing	Continuing

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605051A / Aircraft Survivability Development				ER8 / Common Missile Warning System (CMWS)							
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
CMWS Prime Contractor-- Integration Engineering	TBD	TBD,TBD : TBD	7.787	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Aircraft Integration	TBD	Various : Various	19.974	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Software	TBD	Various : Various	3.000	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Vulnerability and Assesment of Technologies (VAAT)	Various	Various : PM ASE, HSV, AL	-	-		-		1.368	Mar 2019	-		1.368	0.000	1.368	-
JUONS SO-0010 Phase 2a Prime Contractor -- Integration Engineering	Various	Various : Various	3.742	5.100		-		-		-		-	0.000	8.842	-
JUONS SO-0010 Phase 2a Software	Various	Various : Various	1.534	-		-		-		-		-	0.000	1.534	-
JUONS SO-0010 Phase 2a Training	Various	Various : Various	0.200	-		-		-		-		-	0.000	0.200	-
ATW & CIRC M QRC Development Engineering	Various	Northrup Grumman : Rolling Meadow, IL	-	-		5.100		-		-		-	0.000	5.100	-
ATW & CIRC M QRC ATW System Development and Qualification	Various	Various : Various	29.453	24.021		-		-		-		-	Continuing	Continuing	Continuing
ATW & CIRC M QRC Aircraft Integration	Various	Various : Various	1.442	22.781		-		-		-		-	Continuing	Continuing	Continuing
Limited Interim Missile Warning System (LIMWS) - Development Engineering	Various	Various : PM ASE, HSV, AL	-	21.234		-		0.000		10.893	Jan 2019	10.893	0.000	32.127	-
Subtotal			85.158	76.873		9.444		5.216		10.893		16.109	Continuing	Continuing	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER8 / Common Missile Warning System (CMWS)
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
LIMWS - Matrix Support	Various	Various : PM ASE, HSV, AL	-	2.433		-		0.000		3.260	Jan 2019	3.260	0.000	5.693	-
LIMWS - Contractor Support	Various	Various : PM ASE, HSV, AL	-	2.433		-		0.000		6.086	Jan 2019	6.086	0.000	8.519	-
Subtotal			-	4.866		-		0.000		9.346		9.346	0.000	14.212	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
CMWS Test and Evaluation	TBD	Various : Various	16.156	-		-		-		-		-	Continuing	Continuing	Continuing
JUONS SO-0010 Phase 2a Test and Evaluation	Various	Various : Various	21.709	5.000		-		-		-		-	0.000	26.709	-
ATW & CIRCM QRC Test and Evaluation/Tech Manuals	Various	Various : Various	-	3.720		24.000		0.000		5.110	Mar 2019	5.110	Continuing	Continuing	Continuing
LIMWS - Government Testing	Various	Various : PM ASE, HSV, AL	-	-		-		0.000		9.095	Mar 2019	9.095	0.000	9.095	-
Subtotal			37.865	8.720		24.000		0.000		14.205		14.205	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals		133.079	105.362	34.814	5.802	34.933		40.735	Continuing

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER8 / Common Missile Warning System (CMWS)

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CMWS System Dev/Tier 2 and 3 Upgrades (TAD Updates)	[Redacted]																											
CMWS Future Sensor and Algorithm Analysis	[Redacted]																											
JUONS SO-0010 Phase 2a Contractor Logistics Support (Field Su	[Redacted]																											
JUONS SO-0010 Phase 2a Engineering, Integration, and Test	[Redacted]																											
Phase 3 ATW & CIRCM QRC Engineering, Integration, and Test	[Redacted]																											
Phase 4 LIMWS QRC	[Redacted]																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / Aircraft Survivability Development	Project (Number/Name) ER8 / Common Missile Warning System (CMWS)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CMWS System Dev/Tier 2 and 3 Upgrades (TAD Updates)	2	2011	4	2023
CMWS Future Sensor and Algorithm Analysis	1	2017	4	2023
JUONS SO-0010 Phase 2a Contractor Logistics Support (Field Support)	1	2017	4	2023
JUONS SO-0010 Phase 2a Engineering, Integration, and Test	1	2016	3	2018
Phase 3 ATW & CIRCM QRC Engineering, Integration, and Test	2	2016	3	2019
Phase 4 LIMWS QRC	3	2017	4	2023

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0605052A / Indirect Fire Protection Capability Increment 2
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	80.781	175.069	157.710	-	157.710	77.599	32.517	0.000	0.000	0.000	523.676
EY7: IFPC Increment 2 - Block 1	-	80.781	175.069	157.710	-	157.710	77.599	32.517	0.000	0.000	0.000	523.676

Note

Funding for FY17 and out has been realigned for IFPC Inc 2-I Block 1 system development activities from BA4, PE 0604319/DU3 to BA5, PE 0605052/EY7.

A. Mission Description and Budget Item Justification

This program supports the overall integrated Air and Missile Defense (AMD) architecture and provides a robust intercept capability against Cruise Missiles (CM), Unmanned Aircraft System (UAS) and Rocket, Artillery, and Mortar (RAM) threats for deployed forces. The Indirect Fire Protection Capability Increment 2 - Intercept (IFPC Inc 2-I) is a ground-based weapon system that is designed to acquire, track, engage, and defeat the UAS, CM, and RAM threats. The system provides 360-degree protection and simultaneously engages threats arriving from different azimuths. A block acquisition approach is used to provide this capability. The IFPC Inc 2-I Block 1 system consists of an existing interceptor and sensor and development of fire control software and a Multi-Mission Launcher (MML) to support the UAS and CM defeat mission. The IFPC Inc 2-I system will be integrated with the Army Integrated Air and Missile Defense (IAMD) Command and Control (C2) architecture. The IFPC Inc 2-I system is transportable by Army Medium Tactical Vehicles (MTV) common mobile platforms.

FY 2019 Base dollars in the amount of \$157.710 million are designated for the fabrication and delivery of EMD Assets #7-12, program management/administration, system engineering, hardware and software integration, additional spares and system/subsystem developmental testing.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	83.995	175.069	149.506	-	149.506
Current President's Budget	80.781	175.069	157.710	-	157.710
Total Adjustments	-3.214	0.000	8.204	-	8.204
• Congressional General Reductions	-0.041	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.173	-			
• Adjustments to Budget Years	-	-	8.204	-	8.204

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

Appropriation/Budget Activity
2040: *Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)*

R-1 Program Element (Number/Name)
PE 0605052A / *Indirect Fire Protection Capability Increment 2*

Change Summary Explanation

Funding decrease in FY17 of \$2.782 million is for Small Business Innovative Research (SBIR), \$0.391 million is for Small Business Technology Transfer Research (STTR), and \$0.041 million is for Federally Funded Research and Development Centers (FFRDC). FY19 adjustments included a \$9.9 million increase to fund additional Risk Reduction activities and a reduction of \$1.696 million due to revised economic assumptions.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605052A / Indirect Fire Protection Capability Increment 2				Project (Number/Name) EY7 / IFPC Increment 2 - Block 1			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EY7: IFPC Increment 2 - Block 1	-	80.781	175.069	157.710	-	157.710	77.599	32.517	0.000	0.000	0.000	523.676
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Funding for FY17 and out has been realigned for IFPC Inc 2-I Block 1 system development activities from BA4, PE 0604319/DU3 to BA5, PE 0605052/EY7 as the program transitions to EMD.

A. Mission Description and Budget Item Justification

This program supports the overall integrated Air and Missile Defense (AMD) architecture and provides a robust intercept capability against Cruise Missiles (CM), Unmanned Aircraft System (UAS) and Rocket, Artillery, and Mortar (RAM) threats for deployed forces. The Indirect Fire Protection Capability Increment 2 - Intercept (IFPC Inc 2-I) is a ground-based weapon system that is designed to acquire, track, engage, and defeat the UAS, CM, and RAM threats. The system provides 360-degree protection and simultaneously engages threats arriving from different azimuths. A block acquisition approach is used to provide this capability. The IFPC Inc 2-I Block 1 system consists of an existing interceptor and sensor and development of fire control software and a Multi-Mission Launcher (MML) to support the UAS and CM defeat mission. The IFPC Inc 2-I system will be integrated with the Army Integrated Air and Missile Defense (IAMD) Command and Control (C2) architecture. The IFPC Inc 2-I system is transportable by Army Medium Tactical Vehicles (MTV) common mobile platforms.

FY 2019 Base dollars in the amount of \$157.710 million are designated for the fabrication and delivery of EMD Assets #7-12, program management/administration, system engineering, hardware and software integration, additional spares and system/subsystem developmental testing.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: IFPC Inc 2-I Program Management/Admin	21.920	6.834	6.422	-	6.422
Description: Funding is provided for the following efforts: Starting in FY18, R-2A Program Management will be split out into PM Admin, PM System Engineering, and System Engineering & Integration to better align with R-3.					
FY 2018 Plans:					
<ul style="list-style-type: none"> - Continue RDT&E efforts associated with the Engineering and Manufacturing Development (EMD) phase - Perform system engineering, integration, logistics engineering, system test and evaluation management, technical configuration control, cost and business management activities - Conduct system technical reviews and program management reviews - Perform developmental testing and performance evaluations - Perform logistics and maintenance demonstrations 					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / <i>Indirect Fire Protection Capability Increment 2</i>	Project (Number/Name) EY7 / <i>IFPC Increment 2 - Block 1</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<ul style="list-style-type: none"> - Conduct validation of logistics publications - Conduct Material Readiness Assessment <p><i>FY 2019 Base Plans:</i></p> <ul style="list-style-type: none"> - Continue RDT&E efforts associated with Engineering and Manufacturing Development (EMD) phase - Prepare for MS C and Low Rate Initial Production (LRIP) phase - Perform system engineering, integration, logistics engineering, system test and evaluation management, technical configuration control, cost and business management activities - Conduct system technical reviews and program management reviews - Perform developmental testing and performance evaluations to include Developmental Test (#1 & #2) and Limited User Test (LUT) - Conduct Material Readiness Assessment (MRA) - Perform logistics and maintenance demonstrations - Conduct verification of logistics publications <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding supports events planned in their respective years.</p>					
<p><i>Title:</i> IFPC Inc 2-I Program Management - System Engineering</p> <p><i>Description:</i> Funding is provided for the following efforts: Starting in FY18, R-2A Program Management will be split out into PM Admin, PM System Engineering, and System Engineering & Integration to better align with R-3.</p> <p><i>FY 2018 Plans:</i></p> <ul style="list-style-type: none"> - Continue RDT&E efforts associated with the Engineering and Manufacturing Development (EMD) phase - Perform system engineering, integration, logistics engineering, system test and evaluation management, technical configuration control, cost and business management activities - Conduct system technical reviews and program management reviews - Perform developmental testing and performance evaluations - Perform logistics and maintenance demonstrations - Conduct verification of logistics publications - Conduct Material Readiness Assessment <p><i>FY 2019 Base Plans:</i></p> <ul style="list-style-type: none"> - Continue RDT&E efforts associated with the Engineering and Manufacturing Development (EMD) phase 	-	2.852	1.910	-	1.910

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / <i>Indirect Fire Protection Capability Increment 2</i>	Project (Number/Name) EY7 / <i>IFPC Increment 2 - Block 1</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<ul style="list-style-type: none"> - Prepare for MS C and Low Rate Initial Production (LRIP) phase - Perform system engineering, integration, logistics engineering, system test and evaluation management, technical configuration control, cost and business management activities - Conduct system technical reviews and program management reviews - Perform developmental testing and performance evaluations to include Developmental Test (#1 & #2) and Limited User Test (LUT) - Conduct Material Readiness Assessment (MRA) - Perform logistics and maintenance demonstrations - Conduct verification of logistics publications <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding supports events planned in their respective years.</p>					
<p>Title: System Engineering & Integration</p> <p>Description: Funding is provided for the following efforts: Starting in FY18, R-2A Program Management will be split out into PM Admin, PM System Engineering, and System Engineering & Integration to better align with R-3.</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Continue engineering and technical support of MML hardware, software and interface development and integration - Participate in system technical and program management reviews - Perform technical assessments, concept studies, cost reduction, risk reduction, final design, and required documentation - Continue IFPC Integration Lab (I2 Lab) system integration, performance analysis and test - Continue I2 Lab software development and integration - Conduct EMD MML functional checkout - Conduct Material Readiness Assessment <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> - Continue engineering and technical support of MML hardware, software and interface development and integration - Prepare for MS C and Low Rate Initial Production (LRIP) phase - Participate in system technical and program reviews 	-	23.513	12.845	-	12.845

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / <i>Indirect Fire Protection Capability Increment 2</i>	Project (Number/Name) EY7 / <i>IFPC Increment 2 - Block 1</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<ul style="list-style-type: none"> - Perform developmental testing and performance evaluations to include Developmental Test (#1 & #2) and Limited User Test (LUT) - Conduct Material Readiness Assessment (MRA) - Perform technical assessments, concept studies, cost reduction, risk reduction, final design, and required documentation - Continue IFPC Integration Lab (I2 Lab) system integration, performance analysis and test - Continue I2 Lab software development and integration - Complete EMD MML functional checkout <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding supports events planned in their respective years.</p>					
<p>Title: IFPC Inc 2-I Engineering and Technical Support</p> <p>Description: Funding is provided for the following efforts:</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Fabricate and deliver EMD MML Assets #1-6 - Continue engineering and technical support of MML hardware, software, interface development, qualification and integration - Continue MML component hardware, software, and integration development activities - Continue development of MML technical data package - Participate in system technical and program management reviews - Conduct maintenance and repair of EMD MML assets to enable scheduled use in further test activities - Conduct Material Readiness Assessment <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> - Fabricate and deliver EMD MML Assets #7-12 - Continue engineering and technical support of MML hardware, software, interface development, component and system qualification testing and integration - Continue MML component hardware, software, and integration development activities - Complete development of MML technical data package - Participate in system technical and program reviews - Conduct maintenance and repair of EMD MML assets to enable scheduled use in further test activities - Conduct Material Readiness Assessment (MRA) 	36.592	95.875	75.078	-	75.078

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / <i>Indirect Fire Protection Capability Increment 2</i>	Project (Number/Name) EY7 / <i>IFPC Increment 2 - Block 1</i>			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Conduct Functional Configuration Audit (FCA) - Prepare for Low Rate Initial Production (LRIP) FY 2018 to FY 2019 Increase/Decrease Statement: Funding supports events planned in their respective years.					
Title: IFPC Inc 2-I System/Subsystem Development and Integration Description: Funding is provided for the following efforts: FY 2018 Plans: - Continue system component hardware, software, and integration development activities - Participate in system technical and program management reviews - Perform integration, component, and system level qualification, performance verification and risk reduction - Continue system/subsystem hardware, software, and integration test and simulation activities - Perform technical assessments, concept studies, cost reduction, risk reduction, final design, and required documentation - Perform developmental testing and performance evaluations - Conduct failure analysis of Developmental Test (#1) and associated re-design, component re-qualification and testing, and incorporating into system FY 2019 Base Plans: - Continue system component hardware, software, and integration development activities - Participate in system technical and program reviews - Perform integration, component, and system level qualification, performance verification and risk reduction - Continue system/subsystem hardware, software, and integration test and simulation activities - Perform technical assessments, concept studies, cost reduction, risk reduction, final design, and required documentation - Perform developmental testing and performance evaluations - Conduct failure analysis of Developmental Test (#1 & #2) and Limited User Test (LUT) and associated re-design, component re-qualification and testing, and incorporating into system FY 2018 to FY 2019 Increase/Decrease Statement: Funding supports events planned in their respective years.	22.269	20.659	29.957	-	29.957
Title: IFPC Inc 2-I System/Subsystem Logistics Support	-	5.529	2.875	-	2.875

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / Indirect Fire Protection Capability Increment 2	Project (Number/Name) EY7 / IFPC Increment 2 - Block 1

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: Funding is provided for the following efforts:</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Conduct RDT&E logistics and maintenance efforts associated with the Engineering and Manufacturing Development (EMD) phase - Perform logistics engineering and supply chain management activities - Perform logistics and maintenance demonstrations - Conduct validation of logistics publications and manuals <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> - Conduct RDT&E logistics and maintenance efforts associated with the Engineering and Manufacturing Development (EMD) phase - Prepare for MS C and Low Rate Initial Production (LRIP) phase - Perform logistics engineering and supply chain management activities - Perform developmental testing and performance evaluations to include Developmental Test (#2) and Limited User Test (LUT) - Perform logistics and maintenance demonstrations - Conduct verification of logistics publications and manuals <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding supports events planned in their respective years.</p>					
<p>Title: IFPC Inc 2-I System/Subsystem Developmental Testing</p> <p>Description: Funding is provided for the following efforts:</p> <p>FY 2018 Plans:</p> <ul style="list-style-type: none"> - Conduct Component Qualification Testing - Conduct Developmental Testing (#1) - Initiate System Qualification Testing - Conduct End-to-End Modeling and Simulation and Performance Analysis Activities - Conduct Cyber Security test activities <p>FY 2019 Base Plans:</p> <ul style="list-style-type: none"> - Prepare for MS C and Low Rate Initial Production (LRIP) - Continue Component Qualification Testing 	-	19.807	28.623	-	28.623

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / Indirect Fire Protection Capability Increment 2	Project (Number/Name) EY7 / IFPC Increment 2 - Block 1
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
- Conduct Developmental Testing (#2) and Limited User Testing (LUT) - Conduct System Qualification Testing - Conduct End-to-End Modeling and Simulation and Performance Analysis Activities - Continue Cyber Security test activities					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding supports events planned in their respective years.					
Accomplishments/Planned Programs Subtotals	80.781	175.069	157.710	-	157.710

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• C53101: MSE Missile	809.201	1,106.040	871.276	260.000	1,131.276	512.775	734.152	727.032	813.280	793.430	6,627.186
• EF9: System Integration and Test	61.449	78.926	79.283	-	79.283	107.785	111.124	121.376	117.336	0.000	677.279
• EX2: Lower Tier Air Missile Defense (LTAMD) Capability	33.780	76.728	120.374	-	120.374	125.772	376.738	332.322	241.461	0.000	1,307.175
• C50016: Lower Tier Air and Missile Defense (AMD)	126.470	140.826	111.395	-	111.395	130.051	105.044	107.288	106.178	0.000	827.252
• DU3: IFPC2	-	11.303	51.030	-	51.030	146.731	132.361	156.732	21.528	0.000	519.685
• C62002: IFPC INC 2- I BLOCK 1 SYSTEM	19.319	-	31.286	-	31.286	175.576	303.422	273.802	388.377	0.000	1,191.782
• C62001: IFPC Inc 2-I Block 1 Missile	-	57.742	145.636	-	145.636	143.466	99.516	14.472	-	0.000	460.832
• E10: Sentinel	15.368	32.968	39.338	-	39.338	91.534	96.427	80.394	43.874	0.000	399.903
• S40: Army Integrated Air and Missile Defense	273.240	336.420	277.607	-	277.607	200.275	130.860	63.741	33.196	0.000	1,315.339
• BZ5075: IAMD Battle Command System	-	-	0.000	-	0.000	72.307	323.680	428.572	497.974	Continuing	Continuing
• 0604741A: Air Defense Command, Control and Intelligence - Eng Dev	200.205	28.726	95.172	119.300	214.472	15.577	9.310	2.915	29.489	0.000	500.694
• AD5070: AIR & MSL Defense Planning & Control Sys	126.539	35.735	33.837	-	33.837	24.983	49.385	68.021	63.273	0.000	401.773

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / <i>Indirect Fire Protection Capability Increment 2</i>	Project (Number/Name) EY7 / <i>IFPC Increment 2 - Block 1</i>

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

Line Item	FY 2017	FY 2018	FY 2019	FY 2019	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Cost To	
			Base	OCO	Total					Complete	Total Cost
• C62005: <i>IFPC INC 2-I Block 1 Missile 2</i>	-	-	0.000	-	0.000	-	-	12.192	36.278	0.000	48.470

Remarks

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

D. Acquisition Strategy

An independent Cost Benefit Analysis (CBA) was completed in FY2015 and the recommendation was made to continue organic development through the Engineering and Manufacturing Development (EMD) Phase. The Government will fund the Aviation and Missile Research Development and Engineering Center (AMRDEC), U.S Army Aviation and Missile Command Logistic Center (ALC), and Letterkenny Army Depot (LEAD) to continue the development, manufacturing, and testing of the Multi-Mission Launcher (MML) during the Engineering and Manufacturing Development (EMD) phase of the program.

During the EMD phase, the IFPC Inc 2-I Product Office will award tasks on existing contracts for: Sentinel software modification to support Low Slow Small capability; integration of IFPC Inc 2-I software code into the IAMD C2 architecture with IBCS v5.0 baseline fire control software for Initial Operational Test and Evaluation; AIM-9X Block II interceptor software modification; AIM-9X Block II Weapon Interface Controller and Engagement Calculator software development; MML logistics products development; and complete system Critical Design Review. The IFPC Inc 2-I Product Office will conduct MML qualification testing and will conduct publication validation and verification, training, logistics demonstration, developmental flight testing, support a cyber security assessment, and initiate MML Production Technical Data Package (TDP) independent assessment. The IFPC Inc 2-I Product Office will update its Technology Readiness Assessment and receive results from the MML Production TDP assessment to support the Limited User Test, Milestone C, and the Low Rate Initial Production Decision. The IFPC Inc 2-I Product Office has modified its Acquisition Strategy by re-aligning four MML assets, originally designated as part of LRIP, to be test articles for use in IOT&E and other developmental test activities, as required.

The IFPC Inc 2-I Product Office will fund AMRDEC to integrate IFPC Inc 2-I software into the IBCS v4.0 baseline to support the Limited User Test, continue component qualification testing, order materials for EMD assets, assemble two MML assets, and support software integration, test and checkout activities in the I2 Lab.

The IFPC Inc 2-I Product Office will fund LEAD to fabricate components, assemble, and deliver the ten remaining MML assets.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)						Project (Number/Name)						
2040 / 5				PE 0605052A / Indirect Fire Protection Capability Increment 2						EY7 / IFPC Increment 2 - Block 1						
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Program Management - Admin	MIPR	Various : Huntsville, Alabama	-	5.564	Oct 2016	6.834	Oct 2017	6.422	Oct 2018	-		6.422	Continuing	Continuing	Continuing	
PM - System Engineering	MIPR	Various : Huntsville, Alabama	-	-		2.852	Oct 2017	1.910	Oct 2018	-		1.910	Continuing	Continuing	Continuing	
Subtotal			-	5.564		9.686		8.332		-		8.332	Continuing	Continuing	N/A	
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
System Engineering & Integration	MIPR	Multiple Activities : Multiple Locations	-	16.356	Oct 2016	23.513	Oct 2017	12.845	Oct 2018	-		12.845	Continuing	Continuing	Continuing	
Engineering and Product Development/Fabrication	MIPR	Multiple Activities : Multiple Locations	-	36.592	Oct 2016	95.875	Oct 2017	73.585	Oct 2018	-		73.585	Continuing	Continuing	Continuing	
System/Subsystem Development and Integration	MIPR	Multiple Activities : Multiple Locations	-	22.269	Oct 2016	20.659	Oct 2017	29.957	Oct 2018	-		29.957	Continuing	Continuing	Continuing	
Subtotal			-	75.217		140.047		116.387		-		116.387	Continuing	Continuing	N/A	
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
PM Log Support	MIPR	Various : Huntsville, Alabama	-	-		1.429	Oct 2017	0.805	Oct 2018	-		0.805	Continuing	Continuing	Continuing	
Log Support	C/FFP	Potomac Wave Consulting, Inc. : Redstone Arsenal	-	-		4.101	Oct 2017	2.070	Oct 2018	-		2.070	Continuing	Continuing	Continuing	
Subtotal			-	-		5.530		2.875		-		2.875	Continuing	Continuing	N/A	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army Date: February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / Indirect Fire Protection Capability Increment 2	Project (Number/Name) EY7 / IFPC Increment 2 - Block 1
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
System/Subsystem Developmental Testing	IA	Multiple Activities : Multiple Locations	-	-		19.806	Oct 2017	5.664	Oct 2018	-		5.664	Continuing	Continuing	Continuing
System/Subsystem Operational Testing	IA	Multiple Activities : Multiple Locations	-	-		-		24.452	Oct 2018	-		24.452	Continuing	Continuing	Continuing
Subtotal			-	-		19.806		30.116		-		30.116	Continuing	Continuing	N/A
Project Cost Totals			-	80.781		175.069		157.710		-		157.710	Continuing	Continuing	N/A

Remarks


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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / Indirect Fire Protection Capability Increment 2	Project (Number/Name) EY7 / IFPC Increment 2 - Block 1

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Block 1 Milestone B	█				█																							
	Bik 1 Milestone B																											
Block 1 Engineering and Manufacturing Development (EMD) Phase					█				█																			
					Bik 1 EMD Phase																							
MML 3.0 Software Development and Testing	█				█				█																			
	MML 3.0 SW Dev/Test																											
Block 1 System Integration Lab SW Integration	█				█				█																			
	I2 Lab SW Int																											
MML EMD Test Asset Manufacturing and Assembly					█				█				█															
					MML Test Asset Mfg & Assembly																							
MML Component Qualification Testing					█				█																			
					Component Qual Testing																							
Block 1 System Integration Lab MML Integration					█				█				█															
					I2 Lab MML Integration																							
IAMD Integration and System Qualification Testing					█				█																			
					System Qual Testing																							
Material Readiness Assessment (MRA)									█																			
									MRA																			
Block 1 Development Testing (DT #1 & #2)									█				█															
									Bik 1 Dev (Flight) Testing #1 & #2																			
Block 1 Limited User Test (LUT)													█															
													Bik 1 LUT															
Block 1 Milestone C													▲															
													Bik 1 Milestone C															
Block 1 Initial Operational Test & Evaluation (IOT&E)																	█											
																	Bik 1 IOT&E											

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army			Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / <i>Indirect Fire Protection Capability Increment 2</i>	Project (Number/Name) EY7 / <i>IFPC Increment 2 - Block 1</i>	

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Block 1 Initial Operational Capability (IOC)																	 2 Blk 1 IOC											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / <i>Indirect Fire Protection Capability Increment 2</i>	Project (Number/Name) EY7 / <i>IFPC Increment 2 - Block 1</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Block 1 Milestone B	1	2017	3	2018
Block 1 Engineering and Manufacturing Development (EMD) Phase	3	2018	2	2020
MML 3.0 Software Development and Testing	2	2017	4	2019
Block 1 System Integration Lab SW Integration	2	2017	4	2019
MML EMD Test Asset Manufacturing and Assembly	4	2017	3	2020
MML Component Qualification Testing	4	2017	2	2019
Block 1 System Integration Lab MML Integration	3	2018	1	2020
IAMD Integration and System Qualification Testing	4	2018	3	2019
Material Readiness Assessment (MRA)	2	2019	2	2019
Block 1 Development Testing (DT #1 & #2)	1	2019	4	2019
Block 1 Limited User Test (LUT)	4	2019	4	2019
Block 1 Milestone C	2	2020	2	2020
Block 1 Initial Operational Test & Evaluation (IOT&E)	1	2021	2	2021
Block 1 Initial Operational Capability (IOC)	3	2021	3	2021

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0605053A / Ground Robotics
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	70.760	86.167	-	86.167	92.181	68.398	40.277	20.782	0.000	378.565
FB2: Man Transportable Robotic System (MTRS) Inc II	-	0.000	6.780	4.304	-	4.304	4.646	0.000	0.000	0.000	0.000	15.730
FB3: Robotics Architecture	-	0.000	2.003	1.853	-	1.853	2.879	3.905	4.953	1.991	0.000	17.584
FB4: Common Robotic Systems	-	0.000	31.252	29.337	-	29.337	28.438	12.087	0.000	0.000	0.000	101.114
FB6: Squad Multipurpose Equipment Transport (SMET)	-	0.000	16.802	19.139	-	19.139	24.077	23.827	14.255	0.000	0.000	98.100
FB7: Robotics Enhanced Program (REP)	-	0.000	7.989	9.399	-	9.399	9.506	9.554	9.717	9.694	0.000	55.859
FB8: Soldier Borne Sensor (SBS)	-	0.000	2.289	3.469	-	3.469	1.512	1.213	2.239	3.548	0.000	14.270
FB9: MTRS Standardization	-	0.000	3.645	15.698	-	15.698	19.937	16.626	7.927	4.363	0.000	68.196
FG8: Common Robotic Controller	-	0.000	0.000	2.968	-	2.968	1.186	1.186	1.186	1.186	0.000	7.712

Note

Project FG8 Common Robotic Controller is not a new start effort in FY 2019. In FY 2018, the Common Robotic System, Universal Controller was a subset of the Common Robotic System (Individual) program funded on PE 0605053A Ground Robotics Project FB4. The effort will transition from PE 0605053A Ground Robotics, Project FB4 Common Robotic Systems in FY 2018 to PE 0605053A Ground Robotics, Project FG8 Common Robotic Controller in FY 2019.

A. Mission Description and Budget Item Justification

FB2: The Man-Transportable Robotic System (MTRS) Inc. II is a modular medium-sized system providing a multitude of standoff capabilities through different payloads for the Army. These capabilities include detect and confirm presence, identify, disposition, and counter hazards by providing a platform for payloads in support of current and future mission requirements. MTRS Inc. II will support current and future payload missions for the Engineer's route clearance platoons, Special Operational Forces (SOF) detachments, Chemical Biological Radiological and Nuclear (CBRN), and Explosive Ordnance Disposal (EOD) Units. FY 2019 RDTE funds will enable the MTRS Inc. II program to progress through the EMD phase and into LRIP by funding the following: Production Qualification Test asset procurement, test support, design efforts, contract data procurement, program support, travel, Virtual Clearance Training Suite development, and other expenses related to the MTRS Inc. II RDTE program.

FB3: Robotic 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 common architecture for universal controllers. RA includes the construction of program specific Interoperability Profiles (IOP) (i.e. Squad Multi-

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	
<p>Equipment Transport (SMET), Tactical Wheeled Vehicle-Leader Follower (TWV-LF), Route Clearance Interrogation System Type II (RCIS Type II), Common Robotics System (Vehicle) (CRS(V)), Common Robotics System (Individual) (CRS(I)) Inc. II, Common Robotics System (Heavy) (CRS(H)), Enhanced Robotic Payload (ERP), Common Robotic System (Light Reconnaissance) (CRS(LR))/Light Reconnaissance Robot (LRR), Robotic Combat Vehicle-Robotic Wingman (RCV-RW), etc.) and new standards addressing emerging requirements (i.e. Cyber Security, new autonomous behaviors, new payloads, lethality, etc.). FY 2019 RDTE funds support the continued development, finalization, and publishing of the Robotics and Autonomous Systems, Ground (RAS-G) Interoperability Profile (IOP) Version 4.0. IOP V4.0 will provide the required modular open interfaces and compliance test tools for new programs including Robotic Combat Vehicle (RCV) and Enhanced Robotics Payloads (ERP). Additionally, FY 2019 RDTE supports the robotics portfolio wide analysis of software interfaces between active programs including Universal Controller, MTRS Inc. II, CRS(I), RCIS, SMET and Leader Follower.</p> <p>FB4: The Common Robotic System - (Individual) (CRS(I)) is the Army's small sized (<25 lbs.) Soldier back-packable, remotely operated, common robotic system. The system provides dismounted Soldiers with increased standoff capability from hazardous threats. The system consists of a Universal Controller (UC), a suite of payloads, and open architecture common mobility platform allowing for future capability growth. The CRS(I) will be designed so the operator can quickly re-configure for other various missions by adding or removing modules and/or payloads. 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. FY 2019 RDTE funding support up to two vendors to develop prototypes for submission to government down-select. An option will be issued for Low Rate Initial Production (LRIP) to provide 15 RDTE Production Qualification Test (PQT) articles. This funding also supports a government IPT to provide program management, test and evaluation, and programmatic risk mitigation to address Cyber Security Controls, interoperability (IOP), and analysis of collaborative operations with various Unmanned Systems (i.e. MTRS Inc. II, Light Reconnaissance, Short Range Reconnaissance UAS, etc.) assigned at Battalion and below.</p> <p>FB6: Squad Multipurpose Equipment Transport (SMET) will help to reduce Soldier loads by transporting mission specific equipment, resupply equipment, and supplies required for extended operations. The SMET will be capable of carrying the equipment currently required to support Infantry and Engineer Platoons in the Infantry Brigade Combat Team (IBCT) for a 72 hour mission without resupply. The SMET will reduce Soldier load, increase squad mobility during combat operations and dismounted maneuvers. SMET will have open architectures, a remote control, support casualty evacuation, power generation/offload and chemical/biological payloads. FY 2019 RDTE funding supports the development and purchase of Technical Insertions, Logistics Support Data, and SMET Program of Record (POR) production contract to include the Statement of Work (SOW) and Request for Project Proposal (RPP). FY 2019 RDTE funding also supports Developmental testing at Aberdeen and the completion of the Technology Demonstration. Program support to include salaries, travel and miscellaneous expense for the SMET program will also be funded.</p> <p>FB7: The Robotics Enhanced Program (REP) uses a "buy/lease, try, and inform" methodology to evaluate Commercial Off the Shelf (COTS), Government Off the Shelf (GOTS) and Non-Developmental Item (NDI) robotics products that have the potential to enhance Soldier combat effectiveness. Actual operational user feedback and evaluation results obtained inform emerging capabilities and requirements documents as well as support of a return on investment to support future Army decision making. FY 2019 RDTE funds for the REP will be utilized to fund Iteration 19.1 and 19.2 and out-of-cycle iterations which will fund salaries, travel, ERDC and ATEC support, RDECOM support, CoE support, Battle Lab support, and associated experiments. REP will also prepare for and complete Knowledge Point 3 (KP3) in 4QFY19, which will provide a status of the REP to the Program Executive Officer.</p>		

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	
<p>FB8: The Soldier Borne Sensor (SBS) provides a near term solution to three Army Warfighting Challenges at the Infantry Squad level: develop situational understanding, conduct air-ground reconnaissance, and conduct joint combined arms maneuver. The SBS provides the small unit "quick look" capability when higher echelon assets are unavailable and time is of the essence. The system is simple to use, expendable, and deployable in a matter of seconds to support the squad leader's decision-making process. The system allows Soldiers to obtain local situational awareness and understanding of their immediate surroundings while remaining in covered or concealed positions.</p> <p>FB9: The MTRS Standardization project provides the platforms to support integration and testing of payloads and technology for non-standard unmanned ground robotics systems used by Army Engineers, Explosive Ordnance Disposal (EOD), Chemical, Biological, Radiological, and Nuclear (CBRN) and Special Operational Forces (SOF) units. Current system characteristics include the following: a remote controlled articulated arm with a gripper, operating range up to 800 meters, multiple illuminated cameras, a pan/tilt surveillance camera, two-way radio, and a ruggedized operator control unit. The platforms provided will support development and testing of the following capabilities: High Dexterous Manipulation System (HDMS), Multi-Spectral Image Fusion System (MIFS), and Precision Aimed Multi-shot Disruptor (PAMD). The use of robotics allows the first approach, to potentially explosive hazards, to be made by a robot rather than a Soldier. FY 2019 RDTE funding supports the development of a library of robot parts that can be 3D printed via additive manufacturing. The funding will also test the operational compatibility of the 3D printed parts with robot platforms.</p> <p>The Common Robotic System, Heavy (CRS(H)) is a modular large-sized system that provides enhanced protection to the EOD Soldier in order to support the Joint Force Commander with the ability to identify, render safe and dispose of explosive ordnance (EO) and improvised explosive devices (IEDs) in support of the Range of Military Operations (ROMO) and Home Land Defense (HLD) operations. CRS(H) will also enable EOD Soldiers to execute Defense Support of the Civil Authorities (DSCA) operations in response to requests from federal, state, local, and tribal authorities for domestic incidents, emergencies, disasters, designated law enforcement support and other activities. CRS(H) will support current and future missions for Explosive Ordnance Disposal (EOD) and Chemical Biological Radiological and Nuclear (CBRN) units. FY 2019 RDTE funds will enable the CRS(H) program to progress into the EMD/LRIP phases by funding the following: Production Qualification Test asset procurement, test support, design efforts, contract data procurement, program support and engineering, travel, and other expenses related to the CRS(H) RDTE program. The Army Acquisition Objective (AAO) for CRS(H) robots is 225. FY 2019 funding will also be utilized to support Enhanced Robotic Payload (ERP) program initiation.</p> <p>FG8: The Common Robotic Controller/Common Robotic System (Universal Controller) (CRS(UC)) provides the capability to individually and/or concurrently control multiple Unmanned Systems (UxS) platforms and control/monitor a mesh network without having to obtain and/or carry separate Operator Control Unit (OCU)s for each system. A controlled UxS may be mobile or stationary, can be smart learning, and self-adaptive. Two CRS(UC)s will be used to hand-off control of a system to a receiver, reducing hand-off time and the need for the UxSs to have multiple OCUs. The CRS(UC) will also be capable of "hot swapping" batteries where one of its two batteries can be replaced without the system being shut down, halting mission progress, and use current or new Soldier power sources that will maximize its operational time and minimize the number of replacement batteries needed for most missions. The controller will also use haptic indicators inside the hand grips to give the user active feedback of the controlled system's movements if the UxS software is programmed to use them. If and when the use of lethal systems on the CRS(UC) is approved, the weaponized payloads will be controlled via several fail-safe mechanisms to prevent accidental discharge. The intent of this requirement is allow the Soldier at battalion and below to use the Common Robotic System (Universal Controller) to operate unmanned aerial systems (e.g. Raven, PUMA, Short Range Micro</p>		

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>
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(SRM), Lethal Miniature Aerial Munition System (LMAMS), Autonomous Aerial Resupply, etc.) and unmanned ground vehicles (e.g. CRS(I), CRS(V), CRS(H), SMET, MTRS INC II, Light Reconnaissance (LR), Wingman, etc.). In addition, the project will investigate backwards compatibility for the non-standard equipment robots (e.g. FirstLook, SUGV, Soldier Borne Sensor (SBS), MTRS MK II, etc.). FY 2019 RDTE funds will be utilized to conduct user testing and select a Universal Controller.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	70.760	88.117	-	88.117
Current President's Budget	0.000	70.760	86.167	-	86.167
Total Adjustments	0.000	0.000	-1.950	-	-1.950
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-1.950	-	-1.950

Change Summary Explanation

The increase in funding from FY 2018 to FY 2019 is mainly attributable to the increased requirements on Project FB9 associated with the Common Robotic System (Heavy) program, a new start effort in FY 2019. It is also attributable to increased testing and technical insertion and payload efforts in FY 2019 associated with Project FB6 Squad Multipurpose Equipment Transport.

In FY2018 funding for the Man Transportable Robotic System (MTRS) Inc. II transitioned from PE 0604808A Landmine Warfare/Barrier - Eng Dev, Project 415 Mine Neutral/Detection to PE 0605053A Ground Robotics, Project FB2 Man Transportable Robotic System (MTRS) Inc. II; Robotics Architecture transitioned from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB3 Robotics Architecture; Common Robotics Systems (CRS) transitioned from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB4 Common Robotic Systems; Robotic Enhanced Program (REP) transitioned from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB7 Robotic Enhanced Program.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>				Project (Number/Name) FB2 / <i>Man Transportable Robotic System (MTRS) Inc II</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FB2: <i>Man Transportable Robotic System (MTRS) Inc II</i>	-	0.000	6.780	4.304	-	4.304	4.646	0.000	0.000	0.000	0.000	15.730
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2018 funding for the Man Transportable Robotic System (MTRS) Inc II will transition from PE 0604808A Landmine Warfare/Barrier - Eng Dev, Project 415 Mine Neutral/Detection to PE 0605053A Ground Robotics, Project FB2 Man Transportable Robotic System (MTRS) Inc II

A. Mission Description and Budget Item Justification

The Man-Transportable Robotic System (MTRS) Inc. II is a modular medium-sized system providing a multitude of standoff capabilities through different payloads for the Army. These capabilities include detect and confirm presence, identify, disposition, and counter hazards by providing a platform for payloads in support of current and future mission requirements. MTRS Inc. II will support current and future payload missions for the Engineer's route clearance platoons, Special Operational Forces (SOF) detachments, Chemical Biological Radiological and Nuclear (CBRN), and Explosive Ordnance Disposal (EOD) Units. FY 2019 RDTE funds will enable the MTRS Inc. II program to progress through the EMD phase and into LRIP by funding the following: Production Qualification Test asset procurement, test support, design efforts, contract data procurement, SEPM, travel, Virtual Clearance Training Suite development, and other expenses related to the MTRS Inc. II RDTE program.

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

	FY 2017	FY 2018	FY 2019
Title: MTRS Inc II RDTE	-	6.780	4.304
Description: MTRS Inc II RDTE funding to support engineering and logistics data, and various test efforts to include test articles, test execution, and test support staff salaries, and System Engineering Program Management (SEPM) costs.			
FY 2018 Plans: Funding will be used to acquire First Article Test hardware for test, test site, and test site support, fund design efforts to include Critical Design Review (CDR) and contract data, along with program management costs to include salaries, travel and miscellaneous expenses associated with the MTRS Inc II RDTE program.			
FY 2019 Plans: Funding will be used to acquire the remaining Production Qualification Test hardware and test support, fund design efforts and contract data, program management costs to include salaries, travel and miscellaneous expenses associated with the MTRS Inc II RDTE efforts. Funding will also be used for Initial development of the MTRS Inc II integration into the Virtual Clearance Training Suite (VCTS).			
FY 2018 to FY 2019 Increase/Decrease Statement:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB2 / <i>Man Transportable Robotic System (MTRS) Inc II</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Additional funding was required in FY 2018 as the program acquired a significant number of test articles and data deliverables. Less funding is required in FY 2019 as efforts will focus on test and test support costs.			
Accomplishments/Planned Programs Subtotals	-	6.780	4.304

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• R67050: <i>Man-Transportable Robotic Sys Inc II (MTRS Inc II)</i>	5.515	-	6.615	-	6.615	19.015	38.967	37.789	29.896	0.000	137.797

Remarks

D. Acquisition Strategy

The MTRS Inc II acquisition strategy will execute an abbreviated Engineering Manufacturing Development (EMD) phase followed by a Production Deployment phase to integrate available payloads into the MTRS Inc II materiel solution. This EMD/Production Deployment award was based on a selection from a full and open competition. The is contract Firm Fixed Price and includes a Critical Design Review (CDR) in FY18, design integration, Production Qualification Test (FY19), Low Rate Initial Production (LRIP) (FY19) and Full Rate Production (FRP) (FY20). The program will obtain First Unit Equipped (FUE) under a Conditional Materiel Release (CMR) in FY19 while working toward obtaining Full Materiel Release (FMR) in FY21.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / Ground Robotics	Project (Number/Name) FB2 / Man Transportable Robotic System (MTRS) Inc II
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Costs	MIPR	VARIOUS : MULTIPLE	-	-		3.000	Jul 2017	0.253	Oct 2018	-		0.253	0.000	3.253	-
Subtotal			-	-		3.000		0.253		-		0.253	0.000	3.253	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Hardware	SS/FFP	Endeavor : Chelmsford, MA	-	-		3.000	Sep 2017	0.300	Jan 2019	-		0.300	0.000	3.300	-
Virtual Clearance Training Suite (VCTS)	Various	Various : Multiple	-	-		-		0.300	Oct 2018	-		0.300	0.000	0.300	-
Subtotal			-	-		3.000		0.600		-		0.600	0.000	3.600	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
MTRS Inc II MOCU development	Various	Various : Multiple	-	-		-		1.000	Oct 2018	-		1.000	0.000	1.000	-
MTRS Inc II contract data	SS/FFP	Endeavor : Chelmsford, MA	-	-		-		0.551	Oct 2018	-		0.551	0.000	0.551	-
Subtotal			-	-		-		1.551		-		1.551	0.000	1.551	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 site and test site support for FAT	MIPR	VARIOUS : MULTIPLE	-	-		0.780		1.900	Oct 2018	-		1.900	0.000	2.680	-
Subtotal			-	-		0.780		1.900		-		1.900	0.000	2.680	N/A

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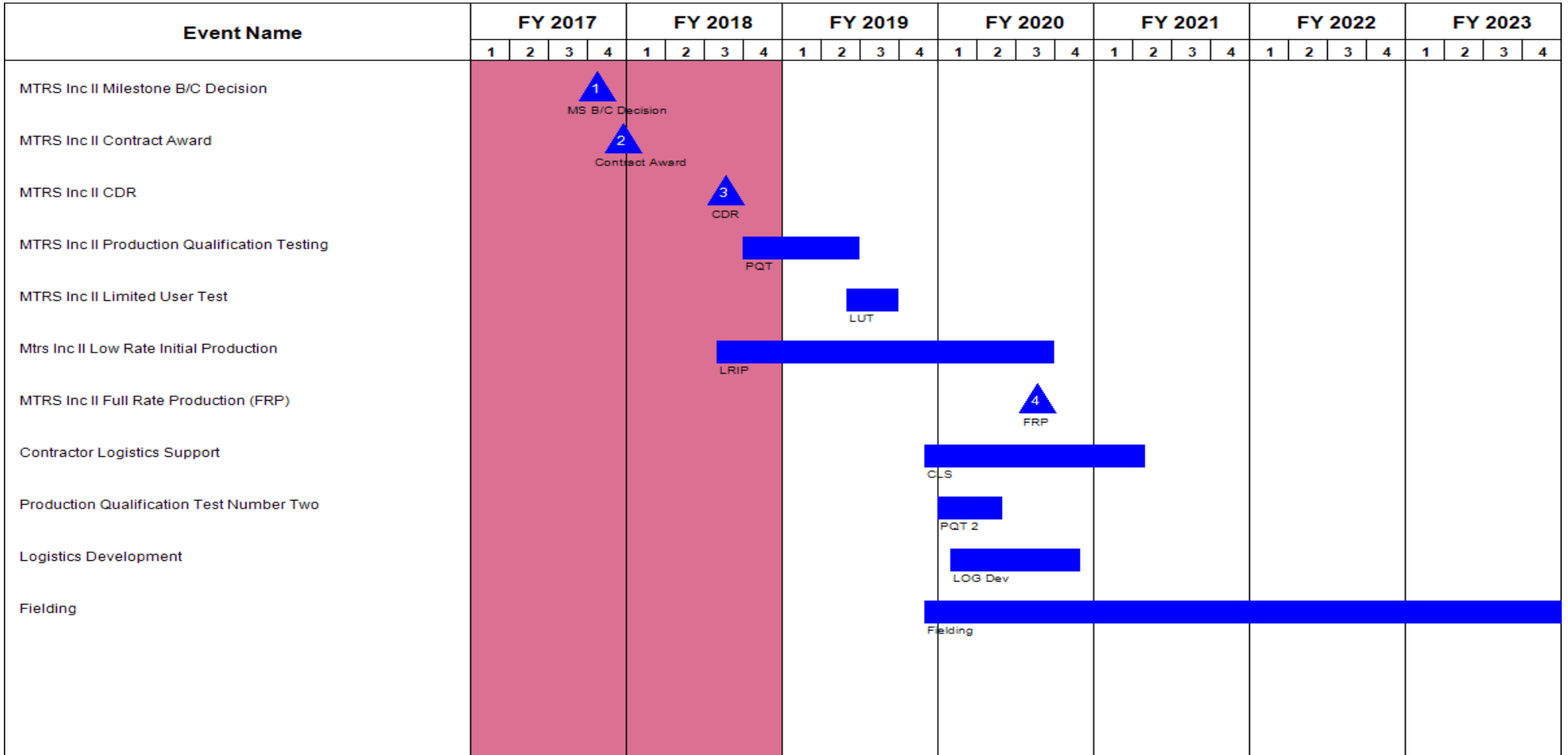
Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army						Date: February 2018		
Appropriation/Budget Activity 2040 / 5			R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>			Project (Number/Name) FB2 / <i>Man Transportable Robotic System (MTRS) Inc II</i>		

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	6.780	4.304	-	4.304	0.000	11.084	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB2 / <i>Man Transportable Robotic System (MTRS) Inc II</i>



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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB2 / <i>Man Transportable Robotic System (MTRS) Inc II</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
MTRS Inc II Milestone B/C Decision	4	2017	4	2017
MTRS Inc II Contract Award	4	2017	4	2017
MTRS Inc II CDR	3	2018	3	2018
MTRS Inc II Production Qualification Testing	4	2018	2	2019
MTRS Inc II Limited User Test	2	2019	3	2019
Mtrs Inc II Low Rate Initial Production	3	2018	3	2020
MTRS Inc II Full Rate Production (FRP)	3	2020	3	2020
Contractor Logistics Support	4	2019	2	2021
Production Qualification Test Number Two	1	2020	2	2020
Logistics Development	1	2020	4	2020
Fielding	4	2019	4	2025

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>				Project (Number/Name) FB3 / <i>Robotics Architecture</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FB3: <i>Robotics Architecture</i>	-	0.000	2.003	1.853	-	1.853	2.879	3.905	4.953	1.991	0.000	17.584
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2018 funding for Robotics Architecture transitioned from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB3 Robotics Architecture.

A. Mission Description and Budget Item Justification

Robotic 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 common architecture for universal controllers. RA includes the construction of program specific Interoperability Profiles (IOP) (i.e. Squad Multi-Equipment Transport (SMET), Tactical Wheeled Vehicle-Leader Follower (TWV-LF), Route Clearance Interrogation System Type II (RCIS Type II), Common Robotics System (Vehicle) (CRS(V)), Common Robotics System (Individual) (CRS(I)) Inc. II, Common Robotics System (Heavy) (CRS(H)), Enhanced Robotic Payload (ERP), Common Robotic System (Light Reconnaissance) (CRS(LR)/Light Reconnaissance Robot (LRR), Robotic Combat Vehicle-Robotic Wingman (RCV-RW), etc.) and new standards addressing emerging requirements (i.e. Cyber Security, new autonomous behaviors, new payloads, lethality, etc.).

Fiscal Year 2019 RDTE supports the continued development, finalization, and publishing of the Robotics and Autonomous Systems, Ground (RAS-G) Interoperability Profile (IOP) Version 4.0. IOP V4.0 will provide the required modular open interfaces and compliance test tools for new programs including Robotic Combat Vehicle (RCV) and Enhanced Robotics Payloads (ERP). Additionally, FY19 RDTE supports the robotics portfolio wide analysis of software interfaces between active programs including Universal Controller, MTRS Inc. II, CRS(I), RCIS, SMET and Leader Follower.

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

	FY 2017	FY 2018	FY 2019
Title: Robotics Architecture	-	2.003	1.853
Description: Provide architecture tools and support for current Program of Record (PoR) to allow for interoperability within the Joint community for Robotics Autonomous Systems.			
FY 2018 Plans:			
FY 2018 funding for Robotics Architecture will complete and update Interoperability Profile (IOP) and tools to evaluate and assess Route Clearance Interrogation System (RCIS), Man-Transportable Robotic System (MTRS) Inc II, Common Robotic System (Individual) (CRS(I)), and initial tools for emerging PoR Tactical Wheeled Vehicle-Leader Follower (TWV-LF), and Squad Multipurpose Equipment Transport (SMET) requirements. It will initiate the development of IOP V4 which will provide interfaces			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB3 / <i>Robotics Architecture</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
for near term emerging programs such as LF, CRS(H), EOD Robotic Payload (ERP), Robotic Combat Vehicle-Robotic Wingman (RCV-RW), and RCIS.			
<i>FY 2019 Plans:</i> FY 2019 funding for Robotics Architecture will apply IOP Conformance Validation Tools on programs of record including the Route Clearance and Interrogation System (RCIS), Man-Transportable Robotic System (MTRS) Inc II, Common Robotic System (Individual) (CRS(I)) Inc II, CRS(LR) and Universal Controller. It will complete and update IOP and tools to evaluate and assess the Common Robotic System, Heavy (CRS(H)) and Enhanced Robotics Payloads (ERP) and refine tools for Leader Follower (LF) and Squad Multi Equipment Transport (SMET). It will continue development and finalization of IOP V4 which will provide interfaces for near term emerging programs such as Lightweight Recon Robot (LRR), Robotic Combat Vehicle, and Autonomous Convoy Operations. The CRS(H) program is a new start effort in FY 2019.			
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Funding delta between FY 2018 and FY 2019 is insignificant.			
Accomplishments/Planned Programs Subtotals	-	2.003	1.853

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

Remarks

D. Acquisition Strategy
In FY 2019 the Robotics Architecture line funds PM personnel to develop IOP tools and supporting infrastructure. It leverages intellectual capital and products which allow for Joint interoperability and helps meet Army Program of Record (PoR) cost and schedule while delivering high quality products for fielding. The architecture and tools developed under this line are central to the Army acquisition philosophy of a modular open systems approach between the major subsystems of robotics and autonomous systems.

E. Performance Metrics
N/A

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB3 / <i>Robotics Architecture</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	MIPR	Various : Multiple	-	-		0.303		0.030	Nov 2018	-		0.030	0.000	0.333	-
Subtotal			-	-		0.303		0.030		-		0.030	0.000	0.333	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
IOP V4	Various	Various : Multiple	-	-		0.800	Jun 2018	0.780	Jun 2019	-		0.780	0.000	1.580	-
AEOIRS & Joint Product Development	Various	Various : Multiple	-	-		0.200	Jun 2018	0.100	Jun 2019	-		0.100	0.000	0.300	-
Instantiation Tool Development	SS/CPFF	DCS : Warren, MI	-	-		0.100	Jun 2018	0.100	Jun 2019	-		0.100	0.000	0.200	-
Universal Controller Interoperability	MIPR	TARDEC : Warren, MI	-	-		0.200	Jun 2018	0.200	Nov 2018	-		0.200	0.000	0.400	-
Conformance Verification Testing (CVT) Update for IOP V4	MIPR	TARDEC : Warren, MI	-	-		0.200	Jun 2018	0.200	Nov 2018	-		0.200	0.000	0.400	-
NAMC OTA ROS-M Controller Development	MIPR	Multiple : Various	-	-		-		0.220	Nov 2018	-		0.220	0.000	0.220	-
Subtotal			-	-		1.500		1.600		-		1.600	0.000	3.100	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Conformance Verification Testing (CVT) Maintenance	MIPR	TARDEC : Warren, MI	-	-		0.100	Jun 2018	0.123	Nov 2018	-		0.123	0.000	0.223	-
Subtotal			-	-		0.100		0.123		-		0.123	0.000	0.223	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army Date: February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB3 / <i>Robotics Architecture</i>
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
IOP Lab Support	MIPR	TARDEC : Warren, MI	-	-		0.100	Jun 2018	0.100	Nov 2018	-		0.100	0.000	0.200	-
Subtotal			-	-		0.100		0.100		-		0.100	0.000	0.200	N/A
			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract				
Project Cost Totals			-	-	2.003	1.853	-	1.853	0.000	3.856	N/A				

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB3 / <i>Robotics Architecture</i>
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Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
IOP V4 Capability Plan (CP) Development					CP Development V4																							
IOP V4 WIPT Kickoff									WIPT V4																			
IOP V4 WG Development									WG V4																			
Conformance Verification Testing (CVT) V3 Update release to industry									Release V3																			
Instantiation tool development									Instantiation Development																			
Conformance Verification Testing (CVT) V4 Development													CVT V4 Development															
IOP V5																	IOP V5											
Conformance Verification Testing (CVT) V5 Development																					CVT V5 Development							
IOP V6																									IOP V6			
Conformance Verification Testing (CVT) V6 Development																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB3 / <i>Robotics Architecture</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
IOP V4 Capability Plan (CP) Development	1	2018	2	2018
IOP V4 WIPT Kickoff	3	2018	3	2018
IOP V4 WG Development	3	2018	3	2019
Conformance Verification Testing (CVT) V3 Update release to industry	1	2018	4	2018
Instantiation tool development	2	2018	4	2018
Conformance Verification Testing (CVT) V4 Development	1	2019	4	2019
IOP V5	1	2020	4	2020
Conformance Verification Testing (CVT) V5 Development	1	2021	4	2021
IOP V6	1	2022	4	2022
Conformance Verification Testing (CVT) V6 Development	1	2023	4	2023

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>				Project (Number/Name) FB4 / <i>Common Robotic Systems</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FB4: <i>Common Robotic Systems</i>	-	0.000	31.252	29.337	-	29.337	28.438	12.087	0.000	0.000	0.000	101.114
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2019 the Common Robotic System, Universal Controller effort will transition from PE 0605053A Ground Robotics, Project FB4 Common Robotic Systems to PE 0605053A Ground Robotics, Project FG8 Common Robotic Controller.

In FY 2018 funding for Common Robotic Systems (CRS) transitioned from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB4 Common Robotic Systems.

A. Mission Description and Budget Item Justification

The Common Robotic System - Individual (CRS(I)) is the Army's small sized (<25 lbs.) Soldier back-packable, remotely operated, common robotic system. The system provides dismounted Soldiers with increased standoff capability from hazardous threats. The system consists of a Universal Controller (UC), a suite of payloads, and open architecture common mobility platform allowing for future capability growth. The CRS(I) will be designed so the operator can quickly re-configure for other various missions by adding or removing modules and/or payloads. 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 Warfighter during major combat, stability, and homeland security operations.

FY 2019 RDTE funding support up to two vendors to develop prototypes for submission to government down-select. An option will be issued for Low Rate Initial Production (LRIP) to provide 15 RDTE Production Qualification Test (PQT) articles. This funding also supports a government IPT to provide program management, test and evaluation, and programmatic risk mitigation to address Cyber Security Controls, interoperability (IOP), and analysis of collaborative operations with various Unmanned Systems (i.e. MTRS Inc. II, Light Reconnaissance, Short Range Reconnaissance UAS, etc.) assigned at Battalion and below.

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

	FY 2017	FY 2018	FY 2019
Title: CRS(I) Engineering Manufacturing Design (EMD)	-	31.252	29.337
Description: Up to two vendors will enter the Engineering & Manufacturing Design (EMD) Phase and support activities up to the Critical Design Review (CDR) to include providing robots to test during the Government run-off.			
FY 2018 Plans:			
This funding supports up to two vendors to participate in Preliminary Design Review (PDR) and prepare for Critical Design Review (CDR) supported by a vendor conducted sub-system developmental test and evaluations. Funding supports both vendors to			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB4 / <i>Common Robotic Systems</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
provide equipment for developmental testing and program management to include technical risk mitigation initiatives. This funding also supports government IPT to provide program management, test and evaluation, and programmatic risk mitigation initiatives.			
<i>FY 2019 Plans:</i> FY 2019 RDTE funding support up to two vendors to develop prototypes for submission to government down-select. An option will be issued for Low Rate Initial Production (LRIP) to provide 15 RDTE Production Qualification Test (PQT) articles. This funding also supports a government IPT to provide program management, test and evaluation, and programmatic risk mitigation to address Cyber Security Controls, interoperability (IOP), and analysis of collaborative operations with various Unmanned Systems (i.e. MTRS Inc. II, Light Reconnaissance, Short Range Reconnaissance UAS, etc.) assigned at Battalion and below.			
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> The reduction between FY 2018 and FY 2019 is accounted for by the Common Controller activities being moved to Project FG8.			
Accomplishments/Planned Programs Subtotals	-	31.252	29.337

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• G99595: <i>Common Robotics System (Individual) (CRS(I))</i>	-	-	3.161	-	3.161	8.297	28.603	49.745	75.093	0.000	164.899

Remarks

D. Acquisition Strategy

The CRS(I) acquisition strategy includes awarding a competitive Cost-Plus/Fixed-Fee (CPFF) contract allowing for up to two contractors to compete in the Engineering and Manufacturing Development (EMD) Phase following Milestone (MS) B (FY18) approval. The EMD phase includes a Critical Design Review (CDR) (FY18), the procurement of Production Qualification Test (PQT) (FY19) assets and a "Government Run-Off" to determine which contractor will proceed into the Production and Deployment (P&D) Phase following MS C (FY19) approval. P&D includes a Firm-Fixed Price (FFP) option for Low Rate Initial Production (LRIP) (FY19), Production Qualification Testing (FY19), Safety Release, Limited User Test (LUT), Conditional Material Release (CMR) (FY20) development of logistics products, Full Material Release (FMR) and Full Rate Production (FRP) (FY21).

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB4 / <i>Common Robotic Systems</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support	MIPR	Combat Support - Combat Service Support : Warren MI	-	-		4.500	Jul 2018	1.736	Dec 2018	-		1.736	0.000	6.236	-
Risk Mitigation	MIPR	Various : Various	-	-		4.250	Aug 2018	0.325	Oct 2018	-		0.325	0.000	4.575	-
Subtotal			-	-		8.750		2.061		-		2.061	0.000	10.811	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 & Design	C/CPFF	tbd : tbd	-	-		15.000	Mar 2018	24.148	Oct 2018	-		24.148	0.000	39.148	-
Government Furnished Equipment	Various	Various : Multiple	-	-		1.881	Jun 2018	2.163	Oct 2018	-		2.163	0.000	4.044	-
Subtotal			-	-		16.881		26.311		-		26.311	0.000	43.192	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Training and external PM services support	Various	Various : Multiple	-	-		5.541	Jun 2018	0.740	Oct 2018	-		0.740	0.000	6.281	-
Subtotal			-	-		5.541		0.740		-		0.740	0.000	6.281	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support	MIPR	Army Test Engineering Center : Various	-	-		0.080	Jun 2018	0.225	Oct 2018	-		0.225	0.000	0.305	-
Subtotal			-	-		0.080		0.225		-		0.225	0.000	0.305	N/A

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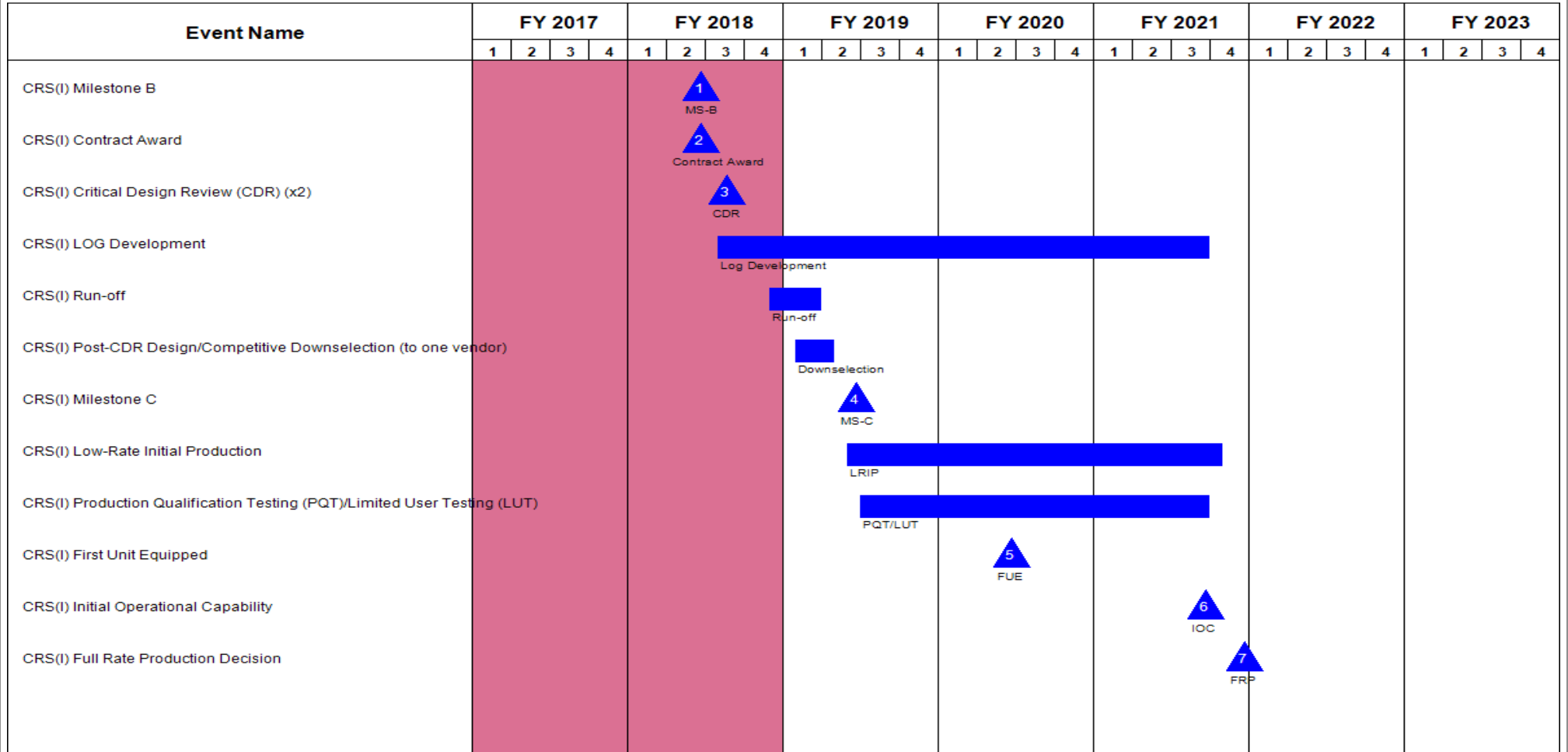
Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army							Date: February 2018				
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0605053A / Ground Robotics			Project (Number/Name) FB4 / Common Robotic Systems				
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	-	-	31.252	29.337	-	29.337	0.000	60.589	N/A		

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB4 / <i>Common Robotic Systems</i>
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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB4 / <i>Common Robotic Systems</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
CRS(I) Milestone B	2	2018	2	2018
CRS(I) Contract Award	2	2018	2	2018
CRS(I) Critical Design Review (CDR) (x2)	3	2018	3	2018
CRS(I) LOG Development	3	2018	3	2021
CRS(I) Run-off	4	2018	1	2019
CRS(I) Post-CDR Design/Competitive Downselection (to one vendor)	1	2019	2	2019
CRS(I) Milestone C	2	2019	2	2019
CRS(I) Low-Rate Initial Production	2	2019	4	2021
CRS(I) Production Qualification Testing (PQT)/Limited User Testing (LUT)	3	2019	3	2021
CRS(I) First Unit Equipped	2	2020	2	2020
CRS(I) Initial Operational Capability	3	2021	3	2021
CRS(I) Full Rate Production Decision	4	2021	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>				Project (Number/Name) FB6 / <i>Squad Multipurpose Equipment Transport (SMET)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FB6: <i>Squad Multipurpose Equipment Transport (SMET)</i>	-	0.000	16.802	19.139	-	19.139	24.077	23.827	14.255	0.000	0.000	98.100
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Squad Multipurpose Equipment Transport (SMET) program funded on PE 0605053A Ground Robotics, Project FB6 was a new start in FY2018.

A. Mission Description and Budget Item Justification

FY 2019 RDTE funds Operational Technology finalization, System downselect and Program of Record (PoR) Full Material Release testing.

Squad Multipurpose Equipment Transport (SMET) will help to reduce Soldier loads by transporting mission specific equipment, resupply equipment, and supplies required for extended operations. The SMET will be capable of carrying the equipment currently required to support Infantry and Engineer Platoons in the Infantry Brigade Combat Team (IBCT) for a 72 hour mission without resupply. The SMET will reduce Soldier load, increase squad mobility during combat operations and dismounted maneuvers. SMET will have open architectures, a remote control and support casualty evacuation, power generation/offload and chemical/biological payloads.

FY2019 RDTE funding supports the development and purchase of Technical Insertions, Logistics Support Data, and SMET Program of Record (POR) production contract development to include the Statement of Work (SOW) and Request for Project Proposal (RPP). FY2019 RDTE funding also supports Developmental testing at Aberdeen and the completion of the Technology Demonstration. Program management costs to include salaries, travel and miscellaneous expense for the SMET program will also be funded.

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

	FY 2017	FY 2018	FY 2019
Title: SMET	-	16.802	19.139
Description: Squad Multipurpose Equipment Transport (SMET)			
FY 2018 Plans:			
Funding will be used to acquire systems from multiple vendors to conduct a Technology Demonstration in support of the Directed Requirement, Aberdeen Test Center support, and associated logistics support. Program management costs to include salaries, travel and miscellaneous expenses associated with the SMET program will also be funded.			
FY 2019 Plans:			
Funding supports the development and purchase of Technical Insertions, Payload platform automation, Logistics Support Data, and SMET Program of Record (POR) production contract development to include the Statement of Work (SOW) and Request			

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB6 / <i>Squad Multipurpose Equipment Transport (SMET)</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
for Project Proposal (RPP). FY2019 RDTE funding also supports Developmental testing at Aberdeen and the completion of the Technology Demonstration, Program Management costs to include salaries, travel and miscellaneous expense for the SMET program.			
FY 2018 to FY 2019 Increase/Decrease Statement: Funding increased from FY 2018 to FY 2019 due to increased testing and tech insertions.			
Accomplishments/Planned Programs Subtotals	-	16.802	19.139

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• R12154: <i>Squad Multipurpose Equipment Transport (SMET)</i>	-	-	0.000	-	0.000	8.768	20.767	45.490	94.681	Continuing	Continuing

Remarks

D. Acquisition Strategy
The Squad Multipurpose Equipment Transport (SMET) assessment effort was completed as part of the Robotics Development effort under the Tactical Unmanned Ground Vehicle (654641DV7) funding line in FY2017. This supported a rapid start to establish an Other Transaction Authority (OTA) agreement supporting the Directed Requirement, signed 14 April 2017. The OTA began with a Request For Project Proposal (RPP), followed by an evaluation and down select to 10 vendors in FY17 as part of the Robotic Enhancement Program under the Tactical Unmanned Ground Vehicle (654641DV7) funding line. In FY18 a down select from 10 to 4 vendors decided which platforms would participate in a 12 month Technology Demonstration. This Technology Demonstration will guide the development of the Capability Production Document (CPD) leading to a Army Requirements Oversight Council (AROC) decision in 3QFY19.

It is the Army's intent to maximize the use of an Open Systems Architecture (OSA), as well as the approved Unmanned Ground Vehicle (UGV) interoperability profiles for SMET. The PdM plans to gather sufficient data during the SMET Technology Demonstration to reduce development efforts and provide cost savings by incorporating the developed SMET technology into the Program of Record. Throughout the life of the program, the Army will continue to survey the marketplace to identify opportunities for technology insertion and required payloads, relying on competition to drive down costs.

E. Performance Metrics
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605053A / Ground Robotics				FB6 / Squad Multipurpose Equipment Transport (SMET)							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Costs	MIPR	PM FP : Warren, MI	-	-		1.000		1.465	Oct 2018	-		1.465	0.000	2.465	-
Subtotal			-	-		1.000		1.465		-		1.465	0.000	2.465	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Directed Requirement Technology Demonstration	C/FFP	Year Long Excursion : TBD	-	-		11.000		2.985	Dec 2018	-		2.985	0.000	13.985	-
Technical Insertions	C/FFP	TBD : TBD	-	-		-		5.200	Nov 2018	-		5.200	0.000	5.200	-
Subtotal			-	-		11.000		8.185		-		8.185	0.000	19.185	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Materiel Battle Lab / TARDEC Technology Demonstration Support	MIPR	TARDEC : Multiple Locations	-	-		1.000		-		-		-	0.000	1.000	-
Logistics Development	MIPR	ILSC : Warren, MI	-	-		-		5.444	Oct 2018	-		5.444	0.000	5.444	-
Subtotal			-	-		1.000		5.444		-		5.444	0.000	6.444	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
ATEC Test Support	MIPR	Army Test Engineering Center : Various	-	-		3.802		2.250	Nov 2018	-		2.250	0.000	6.052	-
Air Drop Testing	MIPR	NATICK : Various	-	-		-		1.795	Dec 2018	-		1.795	0.000	1.795	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army Date: February 2018

Appropriation/Budget Activity 2040 / 5 R-1 Program Element (Number/Name) PE 0605053A / Ground Robotics Project (Number/Name) FB6 / Squad Multipurpose Equipment Transport (SMET)

Table with columns: Test and Evaluation (\$ in Millions), FY 2017, FY 2018, FY 2019 Base, FY 2019 OCO, FY 2019 Total, Cost To Complete, Total Cost, Target Value of Contract. Includes rows for Subtotal and Project Cost Totals.

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB6 / <i>Squad Multipurpose Equipment Transport (SMET)</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
SMET																												
SMET Technology Demonstration Asset Acquisition																												
SMET Analysis of Alternatives (AoA)/MS C Preparation																												
SMET ATEC Testing																												
SMET 1 Year Technology Demonstration																												
SMET Log Development																												
SMET RFP and Performance Spec Development																												
SMET Milestone C																												
SMET Low Rate Initial Production (LRIP)																												
SMET Full Rate Production (FRP)																												
SMET First Unit Equipt (FUE)																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB6 / <i>Squad Multipurpose Equipment Transport (SMET)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
SMET	1	2018	4	2022
SMET Technology Demonstration Asset Acquisition	4	2018	4	2019
SMET Analysis of Alternatives (AoA)/MS C Preparation	1	2018	1	2021
SMET ATEC Testing	2	2018	4	2019
SMET 1 Year Technology Demonstration	4	2018	4	2019
SMET Log Development	4	2018	4	2022
SMET RFP and Performance Spec Development	2	2019	3	2019
SMET Milestone C	1	2020	1	2020
SMET Low Rate Initial Production (LRIP)	2	2020	1	2021
SMET Full Rate Production (FRP)	2	2021	1	2026
SMET First Unit Equipt (FUE)	3	2021	3	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>				Project (Number/Name) FB7 / <i>Robotics Enhanced Program (REP)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FB7: <i>Robotics Enhanced Program (REP)</i>	-	0.000	7.989	9.399	-	9.399	9.506	9.554	9.717	9.694	0.000	55.859
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

In FY 2018 funding for Robotic Enhanced Program (REP) transitions from PE 0604641A Tactical Unmanned Ground Vehicle, Project DV7 Small Unmanned Ground Vehicle to PE 0605053A Ground Robotics, Project FB7 Robotic Enhanced Program.

A. Mission Description and Budget Item Justification

The Robotics Enhanced Program (REP) uses a "buy/lease, try and inform" methodology to evaluate Commercial Off the Shelf (COTS), Government Off the Shelf (GOTS) and Non-Developmental Item (NDI) robotics 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 return on investment to support future Army decision making.

Fiscal Year 2019 RDTE funding for the REP will be utilized to fund Iteration 19.1 and 19.2 and out-of-cycle iterations which will fund salaries, travel, ERDC and ATEC support, RDECOM support, CoE support, Battle Lab support, and associated experiments. REP will also prepare for and complete Knowledge Point 3 (KP3) in 4QFY19, which will provide a status of the REP to the Program Executive Officer.

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

	FY 2017	FY 2018	FY 2019
Title: Robotic Enhanced Program (REP)	-	7.989	9.399
Description: Annual funding for the REP is broken up into two iterations occurring each fiscal year. RDTE funds are utilized in an experimental effort to inform Army User Communities (i.e. Centers of Excellence (CoE), TRADOC, ARIC) determined requirements as outlined in the Robotic and Autonomous Systems (RAS) Strategy.			
FY 2018 Plans: FY 2018 funding for the REP will be utilized to fund Iteration 18.1 and 18.2 and any additional off-cycle iterations as needed, which will fund salaries, travel, Engineer Research and Development Center (ERDC) and Army Test and Evaluation Command (ATEC) support; Research, Development and Engineering Command (RDECOM) support, CoE support, Battle Lab support, and associated experiments.			
FY 2019 Plans: FY 2019 funding for the REP will be utilized to fund Iteration 19.1 and 19.2 and out-of-cycle iterations which will fund salaries, travel, ERDC and ATEC support, RDECOM support, CoE support, Battle Lab support, and associated experiments. REP will also			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB7 / <i>Robotics Enhanced Program (REP)</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
prepare for and complete Knowledge Point 3 (KP3) in 4QFY19, which will provide a status of the REP to the Program Executive Officer.			
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> The delta of a \$1.500 million increase in RDT&E from FY 2018 to FY 2019 supports investigating capabilities to inform numerous emerging Programs of Record (PoR) identified within the LIRA/SPAR between FY 2019-2023.			
Accomplishments/Planned Programs Subtotals	-	7.989	9.399

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

Remarks

D. Acquisition Strategy
The Robotics Enhanced Program (REP) uses a "buy/lease, try and inform" methodology to evaluate Commercial Off the Shelf (COTS), Government Off the Shelf (GOTS) and Non-Developmental Item (NDI) robotics 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 return on investment to support future Army decision making.

E. Performance Metrics
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / Ground Robotics	Project (Number/Name) FB7 / Robotics Enhanced Program (REP)
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	MIPR	Various : Multiple	-	-		0.717	Mar 2018	0.899	Nov 2018	-		0.899	0.000	1.616	-
Subtotal			-	-		0.717		0.899		-		0.899	0.000	1.616	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Iteration 18.1	Various	Various : Multiple	-	-		2.500	Aug 2018	-		-		-	0.000	2.500	-
Iteration 18.2	Various	Various : Multiple	-	-		1.500	Feb 2019	-		-		-	0.000	1.500	-
Iteration 19.1	Various	Various : Multiple	-	-		-		3.000	Nov 2018	-		3.000	0.000	3.000	-
Iteration 19.2	Various	Various : Multiple	-	-		-		2.000	Mar 2019	-		2.000	0.000	2.000	-
Subtotal			-	-		4.000		5.000		-		5.000	0.000	9.000	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Iteration 18.1	Various	Various : Multiple	-	-		2.000	Aug 2018	-		-		-	0.000	2.000	-
Iteration 18.2	Various	Various : Multiple	-	-		1.272	Feb 2019	-		-		-	0.000	1.272	-
Iteration 19.1	Various	Various : Multiple	-	-		-		2.000	Dec 2018	-		2.000	0.000	2.000	-
Iteration 19.2	Various	Various : Multiple	-	-		-		1.500	Apr 2019	-		1.500	0.000	1.500	-
Subtotal			-	-		3.272		3.500		-		3.500	0.000	6.772	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			-	-	7.989	9.399	-	9.399	0.000	17.388	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB7 / <i>Robotics Enhanced Program (REP)</i>
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Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
REP Initiative(s) 18.1					Experiments																							
REP Initiative(s) 18.2									Experiments																			
REP Initiative(s) 19.1													Experiments															
REP Initiative(s) 19.2													Experiments															
REP Initiative(s) 20.1																	Experiments											
REP Initiative(s) 20.2																	Experiments											
REP Initiative(s) 21.1																					Experiments							
REP Initiative(s) 21.2																					Experiments							
REP Initiative(s) 22.1																					Experiments							
REP Initiative(s) 22.2																									Experiments			
REP Initiative(s) 23.1																									Experiments			
REP Initiative(s) 23.2																									Experiments			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB7 / <i>Robotics Enhanced Program (REP)</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
REP Initiative(s) 18.1	1	2018	4	2018
REP Initiative(s) 18.2	3	2018	3	2019
REP Initiative(s) 19.1	1	2019	4	2019
REP Initiative(s) 19.2	3	2019	3	2020
REP Initiative(s) 20.1	1	2020	4	2020
REP Initiative(s) 20.2	3	2020	3	2021
REP Initiative(s) 21.1	1	2021	4	2021
REP Initiative(s) 21.2	3	2021	3	2022
REP Initiative(s) 22.1	1	2022	4	2022
REP Initiative(s) 22.2	3	2022	3	2023
REP Initiative(s) 23.1	1	2023	4	2023
REP Initiative(s) 23.2	3	2023	3	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>				Project (Number/Name) FB8 / <i>Soldier Borne Sensor (SBS)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FB8: <i>Soldier Borne Sensor (SBS)</i>	-	0.000	2.289	3.469	-	3.469	1.512	1.213	2.239	3.548	0.000	14.270
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Soldier Borne Sensor (SBS) provides a near term solution to three Army War-fighting Challenges at the Infantry Squad level: develop situational understanding, conduct air-ground reconnaissance, and conduct joint combined arms maneuver. The SBS provides the small unit "quick look" capability when higher echelon assets are unavailable and time is of the essence. The system is simple to use, expendable, and deployable in a matter of seconds to support the squad leader's decision-making process. The system allows Soldiers to obtain local situational awareness and understanding of their immediate surroundings while remaining in covered or concealed positions.

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

	FY 2017	FY 2018	FY 2019
Title: Soldier Borne Sensor (SBS)	-	2.289	3.469
Description: The SBS provides the small unit a "quick look" capability providing Situational Awareness (SA) of routes, building, tunnels, obstacles blocking line of sight, and similar concealed threat locations.			
FY 2018 Plans: Conduct Production Qualification Testing (PQT), Initial Operational Test and Evaluation (IOT&E) of SBS Increment 1, and initiate integration of Increment 2 technology insertions.			
FY 2019 Plans: Continue to conduct user testing to select and type classification the best value non-developmental solution for SBS Increment 1, and initiate integration of increment 2 technology insertions.			
FY 2018 to FY 2019 Increase/Decrease Statement: This increase is due to maturing research and development of SBS Increment 1, 2 and 3 technology insertions in preparation for subsequent pre production activities.			
Accomplishments/Planned Programs Subtotals	-	2.289	3.469

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• FD2: <i>FD2 - Soldier Robotics Systems</i>	-	1.512	2.130	-	2.130	2.859	3.367	3.345	3.398	Continuing	Continuing

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB8 / <i>Soldier Borne Sensor (SBS)</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• W63798: <i>Soldier Borne Sensor (SBS) (SSN W63798)</i>	-	3.000	11.824	-	11.824	15.531	18.454	3.823	11.866	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Soldier Enhancement Program (SEP) was leveraged to initiate the Soldier Borne Sensor (SBS) program allowing for a Rapid Fielding of capabilities to the field. Post Milestone C, the program office intends to assess whether to leverage non-developmental technologies with each tranche (every two to three years) as tech insertions or to re-compete off the open market. This allows the warfighter to have the most current technology on the market.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB8 / <i>Soldier Borne Sensor (SBS)</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support	Allot	Project Manager Soldier Sensors and Lasers : Fort Belvoir, Virginia 22060	-	-		0.569		0.626	Dec 2018	-		0.626	Continuing	Continuing	-
Subtotal			-	-		0.569		0.626		-		0.626	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	Various : Various	-	-		0.618		0.680	Dec 2018	-		0.680	Continuing	Continuing	-
Subtotal			-	-		0.618		0.680		-		0.680	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support	MIPR	Army Test and Evaluation Command : White Sands Missile Range, New Mexico	-	-		1.102		2.163	Dec 2018	-		2.163	Continuing	Continuing	-
Subtotal			-	-		1.102		2.163		-		2.163	Continuing	Continuing	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
	Project Cost Totals		-	-	2.289	3.469	-	3.469	Continuing	Continuing

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB8 / <i>Soldier Borne Sensor (SBS)</i>
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Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Source Selection									■																			
Milestone C (MS C)									▲ 1 MS C																			
Sample Hardware Evaluation (Increment 1)									■																			
First Unit Equipped (FUE)													▲ 2 FUE															
Technology Insertion Development and Testing (Increment 2)													■															
Technology Insertion Development and Testing (Increment 3)																	■											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB8 / <i>Soldier Borne Sensor (SBS)</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Source Selection	1	2019	1	2019
Milestone C (MS C)	4	2017	4	2017
Sample Hardware Evaluation (Increment 1)	2	2018	3	2019
First Unit Equipped (FUE)	3	2019	3	2019
Technology Insertion Development and Testing (Increment 2)	2	2019	4	2020
Technology Insertion Development and Testing (Increment 3)	4	2020	4	2022

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>				Project (Number/Name) FB9 / <i>MTRS Standardization</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FB9: <i>MTRS Standardization</i>	-	0.000	3.645	15.698	-	15.698	19.937	16.626	7.927	4.363	0.000	68.196
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The CRS(H) program is a new start effort in FY 2019.

A. Mission Description and Budget Item Justification

The MTRS Standardization project provides the platforms to support integration and testing of payloads and technology for non-standard unmanned ground robotics systems used by Army Engineers, Explosive Ordnance Disposal (EOD), Chemical, Biological, Radiological, and Nuclear (CBRN) and Special Operational Forces (SOF) units. Current system characteristics include the following: a remote controlled articulated arm with a gripper, operating range up to 800 meters, multiple illuminated cameras, a pan/tilt surveillance camera, two-way radio, and a ruggedized operator control unit. The platforms provided will support development and testing of the following capabilities: High Dexterous Manipulation System (HDMS), Multi-Spectral Image Fusion System (MIFS), and Precision Aimed Multishot Disruptor (PAMD). The use of robotics allows the first approach, to potentially explosive hazards, to be made by a robot rather than a Soldier.

This project will also support the development of a library of robot parts that can be 3D printed via additive manufacturing. The funding will also test the operational compatibility of the 3D printed parts with robot platforms.

The Common Robotic System, Heavy (CRS(H)) is a modular large-sized system that provides enhanced protection to the EOD Soldier in order to support the Joint Force Commander with the ability to identify, render safe and dispose of explosive ordnance (EO) and improvised explosive devices (IEDs) in support of the Range of Military Operations (ROMO) and Home Land Defense (HLD) operations. CRS(H) will also enable EOD Soldiers to execute Defense Support of the Civil Authorities (DSCA) operations in response to requests from federal, state, local, and tribal authorities for domestic incidents, emergencies, disasters, designated law enforcement support and other activities. CRS(H) will support current and future missions for Explosive Ordnance Disposal (EOD) and Chemical Biological Radiological and Nuclear (CBRN) units. FY 2019 RDTE funds will enable the CRS(H) program to progress into the EMD/LRIP phases by funding the following: Production Qualification Test asset procurement, test support, design efforts, contract data procurement, program support and engineering, travel, and other expenses related to the CRS(H) RDTE program. The Army Acquisition Objective (AAO) for CRS(H) robots is 225. FY 2019 funding will also be utilized to support Enhanced Robotic Payload (ERP) program initiation.

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

	FY 2017	FY 2018	FY 2019
Title: Platform to Support Payload Development & Test	-	1.500	-
Description: Testing of multi-shot disruptor and fire set for EOD robotics systems.			
FY 2018 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB9 / <i>MTRS Standardization</i>
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
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Provide platforms to be used in the development and testing of the following payloads: High Dexterous Manipulation System (HDMS), Multi-Spectral Image Fusion System (MIFS), and Precision Aimed Multishot Disruptor (PAMD).

FY 2018 to FY 2019 Increase/Decrease Statement:
Funding for platform to support payload development and test is not required for FY 2019.

Title: Other Transactional Authority

FY 2018 Plans:
Funding will support the establishment of a library of robot parts which can be 3D printed via additive manufacturing. Funds will also test the operational capability of 3D printed parts with robot platforms.

FY 2019 Plans:
Funds will test the operational capability of 3D printed parts with robot platforms

FY 2018 to FY 2019 Increase/Decrease Statement:
Less funding is required for Fy 2019 for other transactional authority.

Title: CRS(H) / ERP

Description: CRS(H) RDTE funding to support prototype upgrades & testing

FY 2019 Plans:
Funding will be used to award two contracts for CRS(H) prototype enhancements, delivery & testing of Production Qualification Test (PQT) articles, initiation of CRS(H) logistics development, and program management costs to include salaries, travel and miscellaneous expenses associated with the CRS(H) RDTE program.

Funding will also be utilized to support Enhanced Robotic Payload (ERP) program initiation.

FY 2018 to FY 2019 Increase/Decrease Statement:
CRS(H) is a new requirement within this project for FY 2019.

Accomplishments/Planned Programs Subtotals	-	3.645	15.698
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C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

Procure mobility platforms from existing IDIQ contract. Utilize Other Transactional Authority contract for additive manufacturing effort.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army Date: February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB9 / <i>MTRS Standardization</i>
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The CRS(H) acquisition strategy will enter at Milestone B/C and award two contracts to execute a final prototype enhancement phase to upgrade commercial systems to meet the Robotics & Autonomous Systems, Ground (RAS-G) Interoperability Profile (IOP) and cybersecurity requirements, followed by delivery of production representative test articles for performance testing, limited user test and logistics development. Subsequently the program will down-select to one contractor and field production systems under a Conditional Materiel Release (CMR). An Other Transaction Authority (OTA) contract may be utilized if appropriate to accelerate program schedule.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB9 / <i>MTRS Standardization</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
CRS(H) Program Management costs	Various	Various : Multiple	-	-		-		3.488	Oct 2018	-		3.488	0.000	3.488	-
Subtotal			-	-		-		3.488		-		3.488	0.000	3.488	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Platform to Support Payload Development	C/TBD	Robot Logistics Support Center (RLSC) : Selfridge Air National Guard Base (SANG)	-	-		1.500	Feb 2018	-		-		-	0.000	1.500	-
Other Transactional Authority	C/TBD	TBD : TBS	-	-		2.145	Feb 2018	-		-		-	0.000	2.145	-
CRS(H) Developmental Engineering	Various	Various : Multiple	-	-		-		9.080	Oct 2018	-		9.080	0.000	9.080	-
CRS(H) Prototype hardware	Various	Various : Multiple	-	-		-		1.850	Oct 2018	-		1.850	0.000	1.850	-
Subtotal			-	-		3.645		10.930		-		10.930	0.000	14.575	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Transactional Authority	C/TBD	TBD : TBS	-	-		-		1.080	Oct 2018	-		1.080	0.000	1.080	-
CRS(H) System Evaluation	Various	Various : Multiple	-	-		-		0.200	Oct 2018	-		0.200	0.000	0.200	-
Subtotal			-	-		-		1.280		-		1.280	0.000	1.280	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army								Date: February 2018			
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>				Project (Number/Name) FB9 / <i>MTRS Standardization</i>			
	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract		
Project Cost Totals	-	-	3.645	15.698	-	15.698	0.000	19.343	N/A		

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB9 / <i>MTRS Standardization</i>
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Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Platform provided for Payload Test																												
OTA/Additive Manufacturing-3D Printing																												
CRS(H) Milestone Decisions Document (MDD)									▲ 1 MDD																			
CRS(H) Capability Producton Document (CPD)									▲ 2 CPD																			
CRS(H) Request for Proposal (RFP) Release													▲ 3 RFP															
CRS(H) Source Selection Evaluaton Board (SSEB)													■ SSEB															
Milestone B/C													▲ 4 MS B/C															
CRS(H) Contract Award													▲ 5 Contract AWD															
CRS(H) PQT																												
CRS(H) Initial Operational Test																												
CRS(H) Conditional Materiel Release																									▲ 6 CMR			

UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FB9 / <i>MTRS Standardization</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Platform provided for Payload Test	2	2018	4	2018
OTA/Additive Manufacturing-3D Printing	2	2018	4	2019
CRS(H) Milestone Decisions Document (MDD)	2	2018	2	2018
CRS(H) Capability Producton Document (CPD)	2	2018	2	2018
CRS(H) Request for Proposal (RFP) Release	1	2019	1	2019
CRS(H) Source Selection Evaluaton Board (SSEB)	1	2019	1	2019
Milestone B/C	1	2019	1	2019
CRS(H) Contract Award	2	2019	2	2019
CRS(H) PQT	1	2020	3	2020
CRS(H) Initial Operational Test	3	2020	4	2020
CRS(H) Conditional Materiel Release	1	2021	1	2021

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FG8 / <i>Common Robotic Controller</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FG8: <i>Common Robotic Controller</i>	-	0.000	0.000	2.968	-	2.968	1.186	1.186	1.186	1.186	0.000	7.712
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project FG8 Common Robotic Controller is not a new start effort in FY2019. In FY 2018, the Common Robotic System, Universal Controller was a subset of the Common Robotic System (Individual) program funded on PE 0605053A Ground Robotics Project FB4. The effort will transition from PE 0605053A Ground Robotics, Project FB4 Common Robotic Systems in FY 2018 to PE 0605053A Ground Robotics, Project FG8 Common Robotic Controller in 2019.

A. Mission Description and Budget Item Justification

The Common Robotic Controller/Common Robotic System (Universal Controller) (CRS(UC)) provides the capability to individually and/or concurrently control multiple Unmanned Systems (UxS) platforms and control/monitor a mesh network without having to obtain and/or carry separate Operator Control Unit (OCU)s for each system. A controlled UxS may be mobile or stationary, can be smart learning, and self-adaptive. Two CRS(UC)s will be used to hand-off control of a system to a receiver, reducing hand-off time and the need for the UxSs to have multiple OCUs. The CRS(UC) will also be capable of "hot swapping" batteries where one of its two batteries can be replaced without the system being shut down, halting mission progress, and use current or new Soldier power sources that will maximize its operational time and minimize the number of replacement batteries needed for most missions. The controller will also use haptic indicators inside the hand grips to give the user active feedback of the controlled system's movements if the UxS software is programmed to use them. If and when the use of lethal systems on the CRS(UC) is approved, the weaponized payloads will be controlled via several fail-safe mechanisms to prevent accidental discharge. The intent of this requirement is allow the Soldier at battalion and below to use the Common Robotic System (Universal Controller) to operate unmanned aerial systems (e.g. Raven, PUMA, Short Range Micro (SRM), Lethal Miniature Aerial Munition System (LMAMS), Autonomous Aerial Resupply, etc.) and unmanned ground vehicles (e.g. CRS(I), CRS(V), CRS(H), SMET, MTRS INC II, Light Reconnaissance (LR), Wingman, etc.). In addition, the project will investigate backwards compatibility for the non-standard equipment robots (e.g. FirstLook, SUGV, Soldier Borne Sensor (SBS), MTRS MK II, etc.).

The CRS(UC) is defined in the Common Robotic System (Individual) (CRS(I)) Capability Development Document (CDD) and is included in the CRS(I) acquisition. A standalone Capability Production Document (CPD) is being developed to allow CRS(UC) to have a standalone funding line allowing for improving alignment with future programs.

FY 2019 RDTE funds will be utilized to conduct user testing and select a Universal Controller.

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

	FY 2017	FY 2018	FY 2019
Title: CRS(UC) improves Soldier situational awareness while reducing cognitive load on Soldiers and the robotics portfolio logistics footprint	-	-	2.968

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FG8 / <i>Common Robotic Controller</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>Description: The Common Robotic Controller/Common Robotic System (Universal Controller) (CRS(UC)) provides the capability to individually and/or concurrently control multiple Unmanned Systems (UxS) platforms and control/monitor a mesh network without having to obtain and/or carry separate Operator Control Unit (OCU)s for each system. A controlled UxS may be mobile or stationary, can be smart learning, and self-adaptive. Two CRS(UC)s will be used to hand-off control of a system to a receiver, reducing hand-off time and the need for the UxSs to have multiple OCUs. The CRS(UC) will also be capable of "hot swapping" batteries where one of its two batteries can be replaced without the system being shut down, halting mission progress, and use current or new Soldier power sources that will maximize its operational time and minimize the number of replacement batteries needed for most missions. The controller will also use haptic indicators inside the hand grips to give the user active feedback of the controlled system's movements if the UxS software is programmed to use them. If and when the use of lethal systems on the CRS(UC) is approved, the weaponized payloads will be controlled via several fail-safe mechanisms to prevent accidental discharge.</p> <p>FY 2019 Plans: FY 2019 RDTE funds will be utilized to conduct user testing and select a Universal Controller.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: The delta of a \$3.000 million increase in RDT&E from FY 2018 to FY 2019 supports the Department of the Army's intent to separate the CRS(UC) Capability Production Document and from the CRS(I) Program of Record; therefore, a new funding line is required to fund the maturation of the CRS(UC) capabilities.</p>			
Accomplishments/Planned Programs Subtotals	-	-	2.968

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• G99595: <i>Common Robotic System - Individual (CRS(I))</i>	-	-	3.161	-	3.161	8.297	28.603	49.745	75.093	0.000	164.899

Remarks

D. Acquisition Strategy
The Common Robotic System (Universal Controller) is a component of the CRS(I) and does not have its own Acquisition Strategy at this time.

E. Performance Metrics
N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FG8 / <i>Common Robotic Controller</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 support	Various	Various : Multiple	-	-		-		0.468	Jan 2019	-		0.468	0.000	0.468	-
Subtotal			-	-		-		0.468		-		0.468	0.000	0.468	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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	C/CPFF	TBD : TBD	-	-		-		2.500	Jan 2019	-		2.500	0.000	2.500	-
Subtotal			-	-		-		2.500		-		2.500	0.000	2.500	N/A

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract	
	Project Cost Totals		-	-	0.000	2.968	-	2.968	0.000	2.968

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FG8 / <i>Common Robotic Controller</i>
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Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023																							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4																				
EMD Request for Proposal Release	<div style="position: absolute; top: 10%; left: 25%;">1 RFP</div>				<div style="position: absolute; top: 10%; left: 25%;">2 Award</div>				<div style="position: absolute; top: 10%; left: 25%;">3 EMD</div>				<div style="position: absolute; top: 10%; left: 25%;">4 Run-Off</div>				<div style="position: absolute; top: 10%; left: 25%;">5 EMD DT</div>				<div style="position: absolute; top: 10%; left: 25%;">6 MS C</div>				<div style="position: absolute; top: 10%; left: 25%;">7 LRIP</div>				<div style="position: absolute; top: 10%; left: 25%;">8 PQT</div>				<div style="position: absolute; top: 10%; left: 25%;">9 Log Demo</div>				<div style="position: absolute; top: 10%; left: 25%;">10 LUT</div>				<div style="position: absolute; top: 10%; left: 25%;">11 FUE</div>				<div style="position: absolute; top: 10%; left: 25%;">12 FRP</div>			
EMD contract award																																																
Engineering Manufacturing Development (EMD)																																																
EMD Critical Design Review																																																
Run-Off																																																
EMD Developmental Test																																																
Milestone C																																																
LRIP Contract Award																																																
Production Qualification Testing																																																
Log Demo																																																
Limited User Testing																																																
First Unit Equipped																																																
Full Rate Production Decision																																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / <i>Ground Robotics</i>	Project (Number/Name) FG8 / <i>Common Robotic Controller</i>
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
EMD Request for Proposal Release	3	2017	3	2017
EMD contract award	2	2018	2	2018
Engineering Manufacturing Development (EMD)	3	2018	3	2019
EMD Critical Design Review	4	2018	4	2018
Run-Off	1	2019	1	2019
EMD Developmental Test	2	2019	2	2019
Milestone C	2	2019	2	2019
LRIP Contract Award	2	2019	2	2019
Production Qualification Testing	3	2019	1	2020
Log Demo	1	2020	1	2020
Limited User Testing	1	2020	2	2020
First Unit Equipped	2	2020	2	2020
Full Rate Production Decision	4	2021	4	2021

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605054A / <i>Emerging Technology Initiatives</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	0.000	42.866	-	42.866	41.726	35.576	40.537	40.527	0.000	201.232
FI3: <i>Rapid Capability Development and Maturation</i>	-	0.000	0.000	42.866	-	42.866	41.726	35.576	40.537	40.527	0.000	201.232

Note

PE0605054A project FI3 is a realignment from project PE0604798A FG7 for greater transparency of the Army's Rapid Capability Office (RCO) efforts.

A. Mission Description and Budget Item Justification

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)

	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	42.866	-	42.866
Total Adjustments	0.000	0.000	42.866	-	42.866
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	2.875	-	2.875
• Transfer funding from PE0604798A (FG7) to PE060505A (FI3)	-	-	39.991	-	39.991

Change Summary Explanation

FY 2019 program change reflects the \$39.991 million of funding under project PE0604798A FG7 moving to PE0605054A project FI3 for greater transparency of the Army's Rapid Capability Office (RCO) efforts. In FY 2019, an additional \$2.875 million was added to support RCO.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605054A / <i>Emerging Technology Initiatives</i>					Project (Number/Name) F13 / <i>Rapid Capability Development and Maturation</i>		
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
F13: <i>Rapid Capability Development and Maturation</i>	-	0.000	0.000	42.866	-	42.866	41.726	35.576	40.537	40.527	0.000	201.232
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

PE0605054A project F13 is a realignment from project PE0604798A FG7 for greater transparency of the Army's Rapid Capability Office (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
- Operational Needs Statements (ONS)
- Any other operational needs that become a priority as designated by the Army Board of Directors (BOD)

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605054A / <i>Emerging Technology Initiatives</i>	Project (Number/Name) F13 / <i>Rapid Capability Development and Maturation</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<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 2019 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 development and procurement of prototypes, system modification, engineering support, platform integration, integration materials, field service representation, early acquisition documentation, training, and developmental and operational testing needed to initiate limited fielding and/or transition to a procurement ready solution for acquisition. Funds may be used to obtain resources or subject matter expertise to support the execution of an initiative.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding from PE0604798A project FG7 was realigned to PE0605054A Emerging Technologies Initiatives in FY2019 for greater transparency of the Army Rapid Capabilities Office (RCO) effort.</p>	-	-	42.866
Accomplishments/Planned Programs Subtotals	-	-	42.866

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

N/A

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

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605054A / <i>Emerging Technology Initiatives</i>	Project (Number/Name) F13 / <i>Rapid Capability Development and Maturation</i>

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: PB 2019 Army												Date: February 2018				
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)								
2040 / 5				PE 0605054A / Emerging Technology Initiatives				F13 / Rapid Capability Development and Maturation								
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Emerging Technologies Development	Various	TBD : Various	-	-		-		22.000		-		22.000	0.000	22.000	-	
OSD - EW/Cyber Ground PoDs Development	Various	TBD : Various	-	-		-		8.800		-		8.800	0.000	8.800	-	
Subtotal			-	-		-		30.800		-		30.800	0.000	30.800	N/A	
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
Emerging Technologies Engineering Support	TBD	TBD : Various	-	-		-		2.066		-		2.066	0.000	2.066	-	
Subtotal			-	-		-		2.066		-		2.066	0.000	2.066	N/A	
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total				
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract	
OSD - EW/Cyber Ground PoDs Test	TBD	TBD : Various	-	-		-		2.000		-		2.000	0.000	2.000	-	
OSD - UCIDS Test	TBD	TBD : Various	-	-		-		2.000		-		2.000	0.000	2.000	-	
Emerging Technologies Test	TBD	TBD : Various	-	-		-		6.000		-		6.000	0.000	6.000	-	
Subtotal			-	-		-		10.000		-		10.000	0.000	10.000	N/A	
Project Cost Totals			-	-		0.000		42.866		-		42.866	0.000	42.866	N/A	
Remarks																

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605054A / <i>Emerging Technology Initiatives</i>	Project (Number/Name) F13 / <i>Rapid Capability Development and Maturation</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
RCO EW Phase I Development																												
RCO EW Phase I Lab Based Risk Reduction																												
RCO EW Phase I NIE 17.2 NET																												
RCO EW Phase I NIE 17.2 VALEX																												
RCO EW Phase I NIE 17.2 EW Dry Run																												
RCO EW Saber Guardian 17																												
RCO EW Phase I NIE 17.2 EW Assessment																												
RCO EW Phase I YPG C&L Test																												
RCO EW Phase I Deployment																												
RCO EW Phase II Development																												
RCO PNT Sensor Development (fixed and mobile)																												
RCO PNT Test Planning																												
RCO PNT NRE and Integration on Stryker Platforms																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605054A / <i>Emerging Technology Initiatives</i>	Project (Number/Name) F13 / <i>Rapid Capability Development and Maturation</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
RCO PNT NRE and Integration on Heavy Platforms																												
RCO PNT Laboratory Testing of PNT Systems																												
RCO PNT Pseudolite Risk Reduction Testing																												
RCO PNT Safety Release for Customer Test																												
RCO PNT Customer Test																												
RCO PNT C&L and Safety Confirmation																												
RCO PNT Deployment Decision Package																												
RCO PNT BOD Deployment Decision																												
RCO PNT Purchase A Kits																												
RCO PNT Sensor Purchase/Site Surveys																												
RCO PNT Ship A kits to USAREUR																												
RCO Begin Deployment to USAREUR Units																												
RCO OSD Effort Initiation & Engineer Analysis																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605054A / <i>Emerging Technology Initiatives</i>	Project (Number/Name) F13 / <i>Rapid Capability Development and Maturation</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
RCO OSD Operational Assessment FY19																												
RCO OSD Operational Assessment FY20																												
RCO OSD Residual OA Equipment Maintenance FY21																												
RCO OSD Residual OA Equipment Maintenance FY22																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605054A / <i>Emerging Technology Initiatives</i>	Project (Number/Name) F13 / <i>Rapid Capability Development and Maturation</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
RCO EW Phase I Development	2	2017	4	2017
RCO EW Phase I Lab Based Risk Reduction	2	2017	3	2017
RCO EW Phase I NIE 17.2 NET	3	2017	3	2017
RCO EW Phase I NIE 17.2 VALEX	3	2017	3	2017
RCO EW Phase I NIE 17.2 EW Dry Run	4	2017	4	2017
RCO EW Saber Guardian 17	4	2017	4	2017
RCO EW Phase I NIE 17.2 EW Assessment	4	2017	4	2017
RCO EW Phase I YPG C&L Test	4	2017	1	2018
RCO EW Phase I Deployment	2	2018	2	2018
RCO EW Phase II Development	1	2018	4	2018
RCO PNT Sensor Development (fixed and mobile)	4	2017	3	2018
RCO PNT Test Planning	4	2017	2	2018
RCO PNT NRE and Integration on Stryker Platforms	4	2017	3	2018
RCO PNT NRE and Integration on Heavy Platforms	1	2018	3	2018
RCO PNT Laboratory Testing of PNT Systems	3	2017	2	2018
RCO PNT Pseudolite Risk Reduction Testing	2	2018	2	2018
RCO PNT Safety Release for Customer Test	2	2018	2	2018
RCO PNT Customer Test	3	2018	3	2018
RCO PNT C&L and Safety Confirmation	3	2018	3	2018
RCO PNT Deployment Decision Package	3	2018	3	2018
RCO PNT BOD Deployment Decision	4	2018	4	2018
RCO PNT Purchase A Kits	3	2018	2	2019

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605054A / <i>Emerging Technology Initiatives</i>	Project (Number/Name) F13 / <i>Rapid Capability Development and Maturation</i>
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Events	Start		End	
	Quarter	Year	Quarter	Year
RCO PNT Sensor Purchase/Site Surveys	1	2019	2	2019
RCO PNT Ship A kits to USAREUR	1	2019	3	2019
RCO Begin Deployment to USAREUR Units	4	2019	4	2019
RCO OSD Effort Initiation & Engineer Analysis	1	2018	4	2018
RCO OSD Operational Assessment FY19	1	2019	4	2019
RCO OSD Operational Assessment FY20	1	2020	4	2020
RCO OSD Residual OA Equipment Maintenance FY21	1	2021	4	2021
RCO OSD Residual OA Equipment Maintenance FY22	1	2022	4	2022

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605380A / <i>AMF Joint Tactical Radio System (JTRS)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	4.088	8.965	15.984	-	15.984	43.457	8.913	9.029	0.000	0.000	90.436
EG6: <i>Small Airborne Networking Radio (SANR)</i>	-	4.088	8.965	15.984	-	15.984	43.457	8.913	9.029	0.000	0.000	90.436

A. Mission Description and Budget Item Justification

The AMF radios are software programmable, multi-band, multi-mode, mobile ad hoc networking radios, providing simultaneous voice and data communications for Army Aviation platforms. The radios will operate in networks supporting the Common Operating Picture, Situational Awareness, and interoperability of Mission Command systems throughout the battlefield. AMF radios will ensure the Soldier's ability to communicate both horizontally and vertically via voice and data within all mission areas and Common Operating Environment. AMF radios will operate waveforms that are deployed by Joint Forces today, and will introduce networking waveforms to the Aviation community that will enable interoperability between air and ground forces and transport operational and Mission Command information through the tactical network. AMF radios will help close capability gaps by extending data networking to company and below echelons, enabling network services to the platform and connecting Army Aviation platforms to Army ground and Joint air network domains.

Per MDA direction, the AMF Program will procure radios as Non-Developmental Items. FY 2019 RDTE funding allocated to SANR (Project EG6) supports planned program activities, such as, source selection testing and acquisition activities in support of contract award and continued development of documentation to support Milestone C. As part of the CSA Network Review, the Network Cross Functional Team (CFT) is reviewing the current network portfolio, to include review of the SANR program path and Capability Production Document. The SANR Program path forward is expected to evolve based on outcomes of the CSA Network Review and Network CFT efforts, as part of a modernized Army network.

FY 2019 RDTE funds also support the procurement of Link-16 handheld radios for experimentation and concept refinement for air-ground integration, in coordination with the Network CFT.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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 0605380A / <i>AMF Joint Tactical Radio System (JTRS)</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	5.028	8.965	44.938	-	44.938
Current President's Budget	4.088	8.965	15.984	-	15.984
Total Adjustments	-0.940	0.000	-28.954	-	-28.954
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.163	-			
• Adjustments to Budget Years	-	-	-28.954	-	-28.954
• Other Adjustments 2	-0.777	-	-	-	-

Change Summary Explanation

FY 2019 program funding was reduced to reflect program status awaiting CPD approval. The AROC is scheduled for 13 April 2018. Contract award is now planned in FY 2020.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605380A / AMF Joint Tactical Radio System (JTRS)					Project (Number/Name) EG6 / Small Airborne Networking Radio (SANR)		
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EG6: <i>Small Airborne Networking Radio (SANR)</i>	-	4.088	8.965	15.984	-	15.984	43.457	8.913	9.029	0.000	0.000	90.436
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Prior to FY 2014, the Airborne Maritime/Fixed Station (AMF) Joint Tactical Radio System (JTRS) was funded under Navy PE 0604280N, aligned under the Navy JTRS Programs. In accordance with a July 11, 2012 Acquisition Decision Memorandum (ADM), the JTRS Program of Record transitioned to a Military Department-managed program. AMF is now managed by Program Executive Office Command, Control and Communications-Tactical, under Project Manager Tactical Radios, and funded by Army PE 0605380A. On May 2, 2014, the Milestone Decision Authority (MDA), Under Secretary of Defense for Acquisition, Technology, and Logistics, issued an ADM that designated Small Airborne Link 16 Terminal (SALT) and Small Airborne Networking Radio (SANR) as subprograms under the AMF Program. In FY 2015, Project EA9 represented the total Airborne Maritime Fixed Small Airborne (AMF-SA, or SALT) RDT&E budget. In FY 2016, funding was allocated between the SALT (Project EA9) and SANR (Project EG6) subprograms. The SALT subprogram was closed out during FY 2016. Only the SANR subprogram (Project EG6) is funded in FY 2017 and beyond under AMF JTRS.

A. Mission Description and Budget Item Justification

Per MDA direction, AMF JTRS will procure SANR radios as Non-Developmental Items (NDI). The SANR is a two-channel, software-defined, National Security Agency Type 1 certified networking radio providing seamless real-time information for operation in mobile and dynamic combat environments that will meet tactical communications requirements as validated by the Army Aviation community. SANR will provide increased data throughput to Army Aviation platforms via advanced networking capabilities supporting Mid-Tier and Lower Tier tactical networks, and maintain Single Channel Ground and Airborne Radio System (SINCGARS) capability. SANR will replace the current SINCGARS radios on Army Aviation platforms. SANR is planned for implementation on the following platforms: Apache (AH-64E), Black Hawk (UH-60V, UH-60M, HH-60M, and MH-60M), Chinook (CH-47F and MH-47G), and Gray Eagle Unmanned Aircraft System (MQ-1C) aircraft. SANR will enhance and further enable the ability of the maneuver commander to integrate and synchronize aviation forces with land based operational forces. SANR, employed on Army aviation platforms, will enable aviation combat elements (Combat Aviation Brigades, Theater Aviation Brigades, and Special Operations Aviation Regiment) to better utilize the inherent versatility of airborne communications as a complement to the unique capabilities of the other combat arms. SANR will give commanders enhanced Situational Awareness and Mission Command in a package that provides a more responsive means of directing aircraft to match changing maneuver forces situations and missions.

FY 2019 RDTE funding allocated to SANR supports planned program activities, such as, source selection testing and acquisition activities in support of contract award and continued development of documentation to support Milestone C. As part of the CSA Network Review, the Network Cross Functional Team (CFT) is reviewing the current network portfolio, to include review of the SANR program path and Capability Production Document. The SANR Program path forward is expected to evolve based on outcomes of the CSA Network Review and Network CFT efforts, as part of a modernized Army network.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605380A / AMF Joint Tactical Radio System (JTRS)	Project (Number/Name) EG6 / Small Airborne Networking Radio (SANR)		
FY 2019 RDTE funds also support the procurement of Link-16 handheld radios for experimentation and concept refinement for air-ground integration, in coordination with the Network CFT.				
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
<p>Title: Small Airborne Networking Radio (SANR)</p> <p>Description: Small Airborne Networking Radio (SANR)</p> <p>FY 2018 Plans: With FY 2018 funding, the program will continue acquisition activities in support of Acquisition Strategy and associated required documentation approval, market research and final documentation for request for proposal release, and source selection planning in anticipation of FY19 source selection activities.</p> <p>FY 2019 Plans: FY 2019 provides funding necessary to conduct source selection testing and acquisition activities in support of contract award. SANR source selection efforts include evaluation of proposals (document review), test article integration and test execution for each offeror (source selection testing), and evaluation of all selection factors. The program will also continue to develop documentation to support Milestone C. These planned program activities may be influenced by the CSA Network Review and Network Cross Functional Team (CFT) review of the SANR program path forward.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: FY 2019 program funding was reduced to reflect program status awaiting CPD approval.</p>		4.088	8.965	5.984
<p>Title: Air-Ground Integration Experimentation</p> <p>Description: The Army is considering the expanded use of Link-16 to enable Army aviation to enter the joint/coalition air picture; to create low-latency, fused, air-ground pictures in the command post environment; and to provide Joint fires observers the ability to conduct jam-resistant, digital, coalition, close air support coordination. The Army will buy 160 Link-16 handheld radios to equip four brigades, enabling them to conduct experimentation and develop concepts of operation in order to refine requirement for an objective capability.</p> <p>FY 2019 Plans: With FY 2019 RDTE funds, the Army will procure 160 Link-16 handheld radios to equip four brigades, enabling them to conduct experimentation and develop concepts of operation in order to refine requirement for an objective capability.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increased funding for procurement of Link 16 handheld radios for air-ground integration experimentation and requirement refinement.</p>		-	-	10.000
Accomplishments/Planned Programs Subtotals		4.088	8.965	15.984

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605380A / AMF Joint Tactical Radio System (JTRS)	Project (Number/Name) EG6 / Small Airborne Networking Radio (SANR)

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

N/A

Remarks

SANR OPA funding, not reflected in this form, includes \$9.878 million in FY 2020, \$67.043 million in FY 2021, \$141.233 million in FY 2022, and \$168.629 million in FY 2023.

D. Acquisition Strategy

The SANR acquisition strategy is to procure small airborne networking radios for the Apache, Blackhawk, Chinook, and Gray Eagle aircraft. SANR will be capable of operating advanced networking and SINCGARS waveforms. SANR will replace Army Aviation platform SINCGARS ARC-201D radios. The SANR acquisition strategy employs full and open competition using an NDI procurement approach that leverages prior industry and Government investment in software-defined radios. The strategy supports a concept in which NDI radios can be selected from a qualified vendor that meet the AMF SANR CPD requirements.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605380A / AMF Joint Tactical Radio System (JTRS)	Project (Number/Name) EG6 / Small Airborne Networking Radio (SANR)
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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-SA Business Operations Management and Support	Various	Various : Various	2.162	1.974		3.830		1.779		-		1.779	Continuing	Continuing	-
Subtotal			2.162	1.974		3.830		1.779		-		1.779	Continuing	Continuing	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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-SA - System Engineering and Requirements Validation	Various	Various : Various	1.153	1.176		2.913		2.552		-		2.552	Continuing	Continuing	-
AMF-SA - Air-Ground Integration Experimentation	Various	Various : Various	-	-		-		10.000		-		10.000	Continuing	Continuing	-
Subtotal			1.153	1.176		2.913		12.552		-		12.552	Continuing	Continuing	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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-SA - Logistics Support	Various	Various : Various	0.544	0.423		0.634		0.344		-		0.344	Continuing	Continuing	-
Subtotal			0.544	0.423		0.634		0.344		-		0.344	Continuing	Continuing	N/A




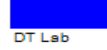
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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605380A / AMF Joint Tactical Radio System (JTRS)	Project (Number/Name) EG6 / Small Airborne Networking Radio (SANR)

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Market Research	Market Research																											
Documentation Development and Staffing	Documentation Development/Staffing																											
RFP Release									1 RFP Release																			
Source Selection Activities and Testing									2 SSEL Act/Test																			
Procurement of Link-16 Handheld Radios									3 Contract Award																			
Radio Prototyping													1 PQT															
Contract Award													1 SINCGARS WSCT															
Production Qualification Test (PQT)													1 RVT															
Single Channel Ground and Airborne Radio System (SINCGARS) Waveform Standard													1 Lower Tier WSCT															
Reliability Verification Test (RVT)													1 Mid-Tier WSCT															
Lower Tier Waveform Standards Conformance Test (WSCT)													1 EW / Threat															
Mid-Tier Waveform Standards Conformance Test (WSCT)																												
Electronic Warfare (EW) / Threat Test																												

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605380A / AMF Joint Tactical Radio System (JTRS)	Project (Number/Name) EG6 / Small Airborne Networking Radio (SANR)

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Limited User Test (LUT)																																
Milestone C																																
Low Rate Initial Production (LRIP) Contract																																
Development Test (DT) Lab																													 			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605380A / AMF Joint Tactical Radio System (JTRS)	Project (Number/Name) EG6 / Small Airborne Networking Radio (SANR)

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Market Research	1	2016	3	2017
Documentation Development and Staffing	1	2016	4	2018
RFP Release	4	2018	4	2018
Source Selection Activities and Testing	1	2019	3	2020
Procurement of Link-16 Handheld Radios	2	2019	2	2019
Radio Prototyping	2	2019	2	2020
Contract Award	3	2020	3	2020
Production Qualification Test (PQT)	4	2020	3	2021
Single Channel Ground and Airborne Radio System (SINCGARS) Waveform Standard	4	2020	1	2021
Reliability Verification Test (RVT)	1	2021	4	2021
Lower Tier Waveform Standards Conformance Test (WSCT)	3	2021	1	2022
Mid-Tier Waveform Standards Conformance Test (WSCT)	3	2021	2	2022
Electronic Warfare (EW) / Threat Test	1	2022	2	2022
Limited User Test (LUT)	3	2022	4	2022
Milestone C	1	2023	1	2023
Low Rate Initial Production (LRIP) Contract	2	2023	2	2023
Development Test (DT) Lab	2	2023	4	2023

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0605450A / Joint Air-to-Ground Missile (JAGM)
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	47.446	34.626	11.773	-	11.773	2.966	1.977	0.000	0.000	0.000	98.788
JA6: Joint Air-To-Ground Missile (JAGM)	-	47.446	34.626	11.773	-	11.773	2.966	1.977	0.000	0.000	0.000	98.788

Program MDAP/MAIS Code: 355

A. Mission Description and Budget Item Justification

The Joint Air-to-Ground Missile (JAGM) program is an Army-led, Acquisition Category (ACAT) IC Major Defense Acquisition Program (MDAP) with joint interest with the U.S. Marine Corps (USMC) and U.S. Navy. The JAGM is the next generation of aviation-launched, fire and forget missiles to replace the HELLFIRE Laser and Longbow radar missiles. JAGM will be used by joint service aircraft for destruction of high value stationary, moving, and relocatable land and maritime targets from standoff range in day, night, adverse weather, and obscured battlefield conditions.

B. Program Change Summary (\$ in Millions)

	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	42.972	34.626	11.900	-	11.900
Current President's Budget	47.446	34.626	11.773	-	11.773
Total Adjustments	4.474	0.000	-0.127	-	-0.127
• Congressional General Reductions	-0.019	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	6.000	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.507	-			
• Adjustments to Budget Years	-	-	-0.127	-	-0.127

Change Summary Explanation

The FY 2017 \$6.000 million funding increase supports improved lethality and range
 The FY 2017 \$1.507 million funding decrease reflects SBIR/STTR transfer
 The FY 2017 \$0.019 million Congressional General Reduction supports FFRDC
 The FY 2019 \$0.127 million funding decrease due to DA Reprogramming

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605450A / Joint Air-to-Ground Missile (JAGM)				Project (Number/Name) JA6 / Joint Air-To-Ground Missile (JAGM)			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
JA6: Joint Air-To-Ground Missile (JAGM)	-	47.446	34.626	11.773	-	11.773	2.966	1.977	0.000	0.000	0.000	98.788
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Joint Air-to-Ground Missile (JAGM) program is an Army-led, Acquisition Category (ACAT) IC Major Defense Acquisition Program (MDAP) with joint interest with the U.S. Marine Corps (USMC) and U.S. Navy. The JAGM is the next generation of aviation-launched, fire and forget missiles to replace the HELLFIRE Laser and Longbow radar missiles. JAGM will be used by joint service aircraft for destruction of high value stationary, moving, and relocatable land and maritime targets from standoff range in day, night, adverse weather, and obscured battlefield conditions.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Engineering and Manufacturing Development (EMD) Contract	2.881	-	-	-	-
Description: The JAGM prime contractor is conducting on-going qualification of the production line, and will deliver missiles to support Developmental and Limited User Testing (LUT). The prime contractor will support government-led activities to qualify the JAGM on the AH-64 Apache.					
Title: Engineering and Manufacturing Development (EMD) Qualification of JAGM and Apache Integration	26.003	7.730	-	-	-
Description: The Government will conduct developmental testing and qualification of the JAGM system, integration onto Apache AH-64E aircraft, lethality modeling, simulation, and effectiveness evaluation.					
FY 2018 Plans: The JAGM Product Office and Other Government Agencies (OGAs) will complete developmental and integration Test and Evaluation (T&E), including LUT, live-fire, initial integrated solution Apache AH-64E flight test, using hardware delivered from the prime contractor. The data will support System Evaluation, Milestone C, and Full Material Release (FMR).					
FY 2018 to FY 2019 Increase/Decrease Statement: JAGM EMD phase and related activities will complete at Milestone C.					
Title: Systems Engineering and Milestone (MS) C Preparation	14.862	6.370	-	-	-
Description: The JAGM Product Office will complete all documentation, conduct evaluations, reviews and analyses to support a FY 2018 Milestone C decision and exercise EMD Contract LRIP options.					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605450A / Joint Air-to-Ground Missile (JAGM)	Project (Number/Name) JA6 / Joint Air-To-Ground Missile (JAGM)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>FY 2018 Plans: The program will complete document development, government testing and systems engineering in support of a MS C decision, per DoD 5000.02 and AR 70-1 guidance.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: JAGM EMD phase and related activities will complete at Milestone C.</p>					
<p>Title: Full Rate Production (FRP) Decision Preparation</p> <p>Description: The JAGM Product Office will confirm that JAGM is producible, as well as operable, safe, and logistically supportable.</p> <p>FY 2018 Plans: The JAGM Product will develop all FRP and FMR documentation, conduct review and perform analyses, and conduct government testing to support a FRP decision.</p> <p>FY 2019 Base Plans: The JAGM Product Office will conduct government testing and Full Materiel Release (FMR) documentation to support a FRP decision.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding increase from FY 2018 to FY 2019 to complete FRP documentation and prepare for Milestone C (FRP Decision Review).</p>	-	2.500	3.118	-	3.118
<p>Title: Post Milestone C Developmental, Integrated, and Operational Testing</p> <p>Description: The JAGM Product Office will demonstrate JAGM Operational Suitability and Effectiveness with AH-64.</p> <p>FY 2018 Plans: The JAGM Product Office and OGAs will conduct Live Fire T&E, verify AH-64 software integration with JAGM Pilot Vehicle Interface (PVI) through captive carry and JAGM flight tests, regression flight tests, environmental and ground launch tests for Safety Release and Airworthiness Release, and Apache-launched flight tests in preparation for IOT&E, FRP decision review, and to support other platform integration.</p> <p>FY 2019 Base Plans:</p>	-	10.526	7.892	-	7.892

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605450A / Joint Air-to-Ground Missile (JAGM)	Project (Number/Name) JA6 / Joint Air-To-Ground Missile (JAGM)

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>The JAGM Product Office and OGAs will complete Live Fire T&E, verify AH-64 software integration with JAGM PVI through captive carry and JAGM flight tests, regression flight tests, environmental and ground launch tests for Safety Release and Airworthiness Release, and Apache-launched flight tests in preparation for IOT&E, and support other platform integration. Data will also support FRP decision review and FMR.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decrease from FY 2018 to FY 2019 for Post Milestone C Developmental, Integrated, and Operational Testing in support of FRP decision.</p>					
<p>Title: Apache AH-64 and JAGM Software Integration</p> <p>Description: Provides full JAGM capability on E-model Apaches</p> <p>FY 2018 Plans: The Apache Project Office, by way of Boeing Company, will develop and provide Pilot-Vehicle interface (PVI) capability that is required for seamless JAGM integration on the Apache platform.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding decrease from FY 2018 to FY 2019 due to the completion of Apache software integration.</p>	3.700	7.500	-	-	-
<p>Title: Integration and Threat Management</p> <p>Description: The Joint Air-to-Ground (JAGM) Product Office will conduct objective platform review, analysis and threat management.</p> <p>FY 2019 Base Plans: The JAGM Product Office will manage and mitigate risk against emerging threats and conduct review and analysis of objective platforms.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Funding allocated to address emerging threats and conduct review and analysis of objective platforms to include technical assessments, concept studies and risk reduction.</p>	-	-	0.763	-	0.763
Accomplishments/Planned Programs Subtotals	47.446	34.626	11.773	-	11.773

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605450A / <i>Joint Air-to-Ground Missile (JAGM)</i>	Project (Number/Name) JA6 / <i>Joint Air-To-Ground Missile (JAGM)</i>
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C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• C70302: <i>Joint Air-to-Ground MSLS (JAGM)</i>	61.911	178.432	276.462	-	276.462	293.589	302.019	305.112	414.099	0.000	1,831.624
• 0605450N: <i>Navy JAGM Missile RDT&E</i>	17.880	15.473	7.086	-	7.086	0.242	0.269	0.276	0.282	Continuing	Continuing
• 0206138M: <i>Navy JAGM Missile Procurement</i>	21.922	3.789	24.374	5.692	30.066	24.379	49.872	50.869	76.886	1,302.797	1,560.580

Remarks

BY 2015

D. Acquisition Strategy

The JAGM EMD acquisition approach outlines the plan to complete developmental testing to qualify the All Up Round (AUR) and the contractor production line, and to integrate JAGM on the U.S. Army AH-64E Apache. Advance Procurement of long lead items (HELLFIRE Romeo backends and Guidance Section subsystems) occurs in FY 2016 - FY 2017. This long lead procurement is needed to facilitate Low Rate Initial Production (LRIP) I, which is necessary to achieve Initial Operational Capability (IOC), and LRIP II.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605450A / Joint Air-to-Ground Missile (JAGM)	Project (Number/Name) JA6 / Joint Air-To-Ground Missile (JAGM)
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Eng/ Project Management	C/LH	Various : Performers	63.631	14.862	Oct 2016	12.230	Oct 2017	3.881	Oct 2018	-		3.881	0.000	94.604	-
Subtotal			63.631	14.862		12.230		3.881		-		3.881	0.000	94.604	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Prime Contract	C/FFP	TD : Prime Contract	371.319	-		-		-		-		-	0.000	371.319	-
Rocket Motor Insensitive Munition (IM) Qualification	C/CPFF	Defense Ordnance Technology Consortium (DOTC) : Picatinny Arsenal, NJ	39.731	-		-		-		-		-	0.000	39.731	-
Electro-Mechanical Control Actuator System (EMCAS)	C/CPFF	Defense Ordnance Technology Consortium (DOTC) : Picatinny Arsenal, NJ	4.033	-		-		-		-		-	0.000	4.033	-
Integrated Warhead	C/CPFF	Defense Ordnance Technology Consortium (DOTC) : Picatinny Arsenal, NJ	2.982	-		-		-		-		-	0.000	2.982	-
EMD Long Lead Contract (Backends)	SS/FFP	Lockheed Martin : Orlando, FL	8.082	-		-		-		-		-	0.000	8.082	-
Development Engineering	C/LH	Various : Performers	21.648	-		-		-		-		-	0.000	21.648	-
EMD Prime Contract	C/FPIF	Lockheed Martin : Orlando, Florida	64.360	2.881	May 2017	-		-		-		-	0.000	67.241	-
Apache Indefinite Delivery/ Indefinite Quantity (IDIQ) Contract	C/CPFF	Boeing Company : Mesa, AZ	7.900	3.700	Jul 2017	7.500	Dec 2017	-		-		-	0.000	19.100	-
Subtotal			520.055	6.581		7.500		-		-		-	0.000	534.136	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605450A / Joint Air-to-Ground Missile (JAGM)	Project (Number/Name) JA6 / Joint Air-To-Ground Missile (JAGM)
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Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			

Remarks
 (C / FFP) - Competitive/Firm Fixed Price
 (C / CPFF) - Competitive/Cost-Plus Fixed Fee
 (C / LH) - Competitive/Labor Hour
 (SS / FFP) - Sole Source/Firm Fixed Price
 (C / FPIF) - Competitive/Fixed Price Incentive (Firm Target)

 Apache IDIQ FY 2018 Contract Award date moved from December 2017 to February 2018

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Gov Agencies	C/LH	Various : Performers	80.859	26.003	Nov 2016	14.896	Nov 2018	7.892	Nov 2018	-		7.892	0.000	129.650	-
Subtotal			80.859	26.003		14.896		7.892		-		7.892	0.000	129.650	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			664.545	47.446	34.626	11.773	-	11.773	0.000	758.390	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605450A / Joint Air-to-Ground Missile (JAGM)	Project (Number/Name) JA6 / Joint Air-To-Ground Missile (JAGM)

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
EMD																												
Army System & Integration Testing																												
Limited User Testing (LUT)					▲ 1																							
MS C Decision								▲ 2																				
Initial Operational Test & Evaluation (IOT&E)									▲ 3																			
Full Rate Production (FRP) Decision												▲ 4																
Software Upgrade Against Emerging Threats																												

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605450A / <i>Joint Air-to-Ground Missile (JAGM)</i>	Project (Number/Name) JA6 / <i>Joint Air-To-Ground Missile (JAGM)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Final Design and Design Verification Test	2	2013	1	2014
Component Qualification Testing	2	2014	4	2014
System Qualification Testing	3	2014	4	2015
MS Decision Preparation	1	2013	4	2015
EMD	4	2015	3	2018
Army System & Integration Testing	4	2015	3	2018
Limited User Testing (LUT)	2	2018	2	2018
MS C Decision	3	2018	3	2018
Initial Operational Test & Evaluation (IOT&E)	2	2019	2	2019
Full Rate Production (FRP) Decision	4	2019	4	2019
Software Upgrade Against Emerging Threats	1	2020	4	2039

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0605457A / Army Integrated Air and Missile Defense (AIAMD)							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	273.240	336.420	277.607	-	277.607	200.275	130.860	63.741	33.196	0.000	1,315.339
S40: Army Integrated Air and Missile Defense	-	273.240	336.420	277.607	-	277.607	200.275	130.860	63.741	33.196	0.000	1,315.339

A. Mission Description and Budget Item Justification

The Army Integrated Air and Missile Defense (AIAMD) program is a designated Major Defense Acquisition Program (MDAP).

The AIAMD program is a direct response to the U.S. Army Air and Missile Defense (AMD) Concept and Operational and Organizational (O&O) Plan for the Future Force, the AIAMD System of Systems (SoS) Capabilities Development Document (CDD) and the Air and Missile Defense Task Force Concept of Operations (CONOPS). The AIAMD Program is uniquely structured to enable the development of an overarching SoS capability with all participating Air Defense Artillery (ADA) components functioning interdependently to provide total operational capabilities not achievable by the individual element systems. The AIAMD program achieves this objective by establishing the AIAMD architecture and developing (1) the IAMD Battle Command Systems (IBCS) Engagement Operations Center (EOC) that provides the common Mission Command capability, (2) the Integrated Fire Control Relay capability for fire control connectivity and distributed operations, and (3) the common Plug and Fight (P&F) Kits that network enable multiple sensor components, weapon components, and the IBCS EOC.

The AIAMD Program will provide advanced capabilities to the Army and the soldier by allowing transformation to a network-centric system-of-systems capability (also referred to as "Plug and Fight") that integrates AMD sensors and weapons with the IBCS EOC. The AIAMD SoS architecture will enable extended range and non-line-of-sight engagements, to include joint kill chain engagements across the full spectrum of aerial threats, providing fire control quality data to the most appropriate weapon to complete the mission successfully. Further, it will mitigate the coverage gaps and the single points of failure that have plagued AMD defense design in the past. The AIAMD program will provide the user with the ability to train on a single Integrated Air and Missile Defense Battle Command System that will result in overall training savings. The AIAMD program will also provide the Army with the ability to procure components that will build to established Integrated Fire Control interfaces alleviating the cost of procuring total system capabilities in the future.

Funding in FY 2019 will provide for continuation of software development and developmental test phase activities, to include preparation and conduct of developmental flight test.

Fielding of the IBCS is the Army Air Defense Artillery User's number one priority. The AIAMD Initial Operational Capability (IOC) will be delivered through fielding of the IBCS EOC-based AIAMD architecture including the IBCS EOC, Sentinel, and Patriot components connected via an IFCN, working in an integrated manner. Additional capabilities include the incorporation of IBCS functionality into Air Defense Airspace Management (ADAM) Cells, ADA Brigade Headquarters, Army Air and Missile Defense Command (AAMDC) Headquarters, and Indirect Fire Protection Capability (IFPC). Future additional capabilities include incorporation of Terminal High Altitude Air Defense (THAAD) batteries into the AIAMD architecture.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605457A / <i>Army Integrated Air and Missile Defense (AIAMD)</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	272.811	336.420	290.250	-	290.250
Current President's Budget	273.240	336.420	277.607	-	277.607
Total Adjustments	0.429	0.000	-12.643	-	-12.643
• Congressional General Reductions	-0.130	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	30.000	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-9.441	-			
• Adjustments to Budget Years	-	-	-12.643	-	-12.643
• RAA not appropriated	-20.000	-	-	-	-

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

Project: S40: *Army Integrated Air and Missile Defense*

Congressional Add: *Product Development - Cybersecurity*

Congressional Add: *Product Development - Rapid Threat*

	FY 2017	FY 2018
	15.000	-
	15.000	-
Congressional Add Subtotals for Project: S40	30.000	-
Congressional Add Totals for all Projects	30.000	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605457A / <i>Army Integrated Air and Missile Defense (AIAMD)</i>					Project (Number/Name) S40 / <i>Army Integrated Air and Missile Defense</i>		
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
S40: <i>Army Integrated Air and Missile Defense</i>	-	273.240	336.420	277.607	-	277.607	200.275	130.860	63.741	33.196	0.000	1,315.339
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The AIAMD program is a direct response to the U.S. Army Air and Missile Defense (AMD) Concept and Operational and Organizational (O&O) Plan for the Future Force, the AIAMD System of Systems (SoS) Capabilities Development Document (CDD) and the Air and Missile Defense Task Force Concept of Operations (CONOPS). The AIAMD Program is uniquely structured to enable the development of an overarching SoS capability with all participating Air Defense Artillery (ADA) components functioning interdependently to provide total operational capabilities not achievable by the individual element systems. The AIAMD program achieves this objective by establishing the AIAMD architecture and developing (1) the IAMD Battle Command Systems (IBCS) Engagement Operations Center (EOC) that provides the common Mission Command capability, (2) the Integrated Fire Control Relay capability for fire control connectivity and distributed operations, and (3) the common Plug and Fight (P&F) Kits that network enable multiple sensor components, weapon components, and the IBCS EOC.

The AIAMD Program will provide advanced capabilities to the Army and the soldier by allowing transformation to a network-centric system-of-systems capability (also referred to as "Plug and Fight") that integrates AMD sensors and weapons with the IBCS EOC. The AIAMD SoS architecture will enable extended range and non-line-of-sight engagements, to include joint kill chain engagements across the full spectrum of aerial threats, providing fire control quality data to the most appropriate weapon to complete the mission successfully. Further, it will mitigate the coverage gaps and the single points of failure that have plagued AMD defense design in the past. The AIAMD program will provide the user with the ability to train on a single Integrated Air and Missile Defense Battle Command System that will result in overall training savings. The AIAMD program will also provide the Army with the ability to procure components that will build to established Integrated Fire Control interfaces alleviating the cost of procuring total system capabilities in the future.

Funding in FY 2019 will provide for continuation of software development and developmental test phase activities, to include preparation and conduct of developmental flight test.

Fielding of the IBCS is the Army Air Defense Artillery User's number one priority. The AIAMD Initial Operational Capability (IOC) will be delivered through fielding of the IBCS EOC-based AIAMD architecture including the IBCS EOC, Sentinel, and Patriot components connected via an IFCN, working in an integrated manner. Additional capabilities include the incorporation of IBCS functionality into Air Defense Airspace Management (ADAM) Cells, ADA Brigade Headquarters, Army Air and Missile Defense Command (AAMDC) Headquarters, and Indirect Fire Protection Capability (IFPC). Future additional capabilities include incorporation of Terminal High Altitude Air Defense (THAAD) batteries into the AIAMD architecture.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Product Development	184.079	262.891	218.106	-	218.106

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605457A / Army Integrated Air and Missile Defense (AIAMD)	Project (Number/Name) S40 / Army Integrated Air and Missile Defense			
B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: Product development in support of software development and developmental test phase activities.</p> <p>FY 2018 Plans: Provides for the continuation of software development and developmental test activities, and ongoing risk reduction test.</p> <p>FY 2019 Base Plans: Provides for the completion of software development with Patriot Radar/Launchers and Sentinel, continuation of software development with Patriot/Sentinel/IFPC MML, and start up of software development efforts to add AAMDC/BDE HQ ADAM and second IFPC missile. Funding also provides support for developmental test activities, to include software integration testing and preparation and conduct of developmental flight.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Increase is a result of EMD extension.</p>					
<p>Title: Government Program Management</p> <p>Description: Government program management in support of the developmental phase test activities.</p> <p>FY 2018 Plans: Provides for government program management in support of the developmental test phase activities and ongoing risk reduction test.</p> <p>FY 2019 Base Plans: Provides for government program management in support of the developmental test phase activities and ongoing risk reduction test.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Decrease is a result of personnel labor cost transferring to Acquisition O&M.</p>	3.641	4.853	2.683	-	2.683
<p>Title: Test and Evaluation</p> <p>Description: Test and Evaluation support for modeling and simulation and developmental test phase activities.</p> <p>FY 2018 Plans:</p>	55.520	68.676	56.818	-	56.818

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605457A / Army Integrated Air and Missile Defense (AIAMD)	Project (Number/Name) S40 / Army Integrated Air and Missile Defense
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Provides for continuation of Modeling and Simulation, Joint Interoperability Test Support, Army Evaluation Center/Developmental Test Command/Operational Test Command support and White Sands Missile Range Test Support for developmental test activities. FY 2019 Base Plans: Provides for continuation of Modeling and Simulation, Joint Interoperability Test Support, Army Evaluation Center/Developmental Test Command/Operational Test Command support and White Sands Missile Range Test Support for developmental test activities, including preparation and conduct of the developmental flight test. FY 2018 to FY 2019 Increase/Decrease Statement: Increase is a result of EMD extension.					
Accomplishments/Planned Programs Subtotals	243.240	336.420	277.607	-	277.607

	FY 2017	FY 2018
Congressional Add: Product Development - Cybersecurity FY 2017 Accomplishments: N/A	15.000	-
Congressional Add: Product Development - Rapid Threat FY 2017 Accomplishments: N/A	15.000	-
Congressional Adds Subtotals	30.000	-

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• C53101: SSN C53101, MSE Missile	809.201	1,106.040	871.276	260.000	1,131.276	512.775	734.152	727.032	813.280	793.430	6,627.186
• EF9: PE 0205456, Project EF9, System Integration and Test	61.449	78.926	79.283	-	79.283	107.785	111.124	121.376	117.336	Continuing	Continuing
• EX2: PE 0604114A, Project EX2, Lower Tier Air and Missile Defense (LTAMD) Capability	33.780	76.728	120.374	-	120.374	125.772	376.738	332.322	241.461	Continuing	Continuing
• C50016: SSN C50016, Lower Tier Air and Missile Defense (AMD)	126.470	140.826	111.395	-	111.395	130.051	105.044	107.288	106.178	Continuing	Continuing

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605457A / Army Integrated Air and Missile Defense (AIAMD)	Project (Number/Name) S40 / Army Integrated Air and Missile Defense
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• DU3: PE 0604319A, Proj DU3, IFPC2 (FY12 PE0603305A IFPC II- Intercept)	-	11.303	51.030	-	51.030	146.731	132.361	156.732	21.528	Continuing	Continuing
• EY7: PE 0605052A, Project EY7, IFPC Increment 2 - Block 1	80.781	175.069	157.710	-	157.710	77.599	32.517	-	-	Continuing	Continuing
• C62002: SSN C62002, IFPC Inc 2-I Block 1 System	-	-	0.000	-	0.000	175.576	303.422	273.802	388.377	Continuing	Continuing
• C62001: SSN C62001, IFPC INC 2-I Block 1 Missile	-	57.742	145.636	-	145.636	143.466	99.516	14.472	-	0.000	460.832
• E10: PE 0604820A, Proj E10, SENTINEL	15.368	32.968	39.338	-	39.338	91.534	96.427	80.394	43.874	Continuing	Continuing
• BZ5075: SSN BZ5075, Army IAMD Battle Command System (IBCS)	-	-	0.000	-	0.000	72.307	323.680	428.572	497.974	Continuing	Continuing
• 146: PE 0604741A, Proj 146, Air Defense C2I Eng Dev	14.987	24.306	24.326	-	24.326	14.300	8.401	2.915	1.228	Continuing	Continuing
• AD5070: AIR & MSL Defense Planning & Control Sys	126.539	35.735	33.837	-	33.837	24.983	49.385	68.021	63.273	0.000	401.773
• 149: PE 0604741A, 149, Air Defense C2I Eng Dev	24.899	4.420	1.846	-	1.846	1.277	0.909	-	-	0.000	33.351

Remarks

This program is an integral part of the Army Integrated Air and Missile Defense (AIAMD) architecture. It provides for development of a common Integrated Fire Control System through an open architecture approach allowing for integration of Air Defense Artillery (ADA) components as they become available. This approach enables the AIAMD program to pursue its baseline program independent of fluctuation of other programs.

D. Acquisition Strategy

The AIAMD acquisition strategy is to deliver an Initial Operational Capability (IOC) in FY22. The capabilities are delivered through the fielding of the IAMD Battle Command System (IBCS) Engagement Operations Center (EOC)-based AIAMD architecture including the IBCS EOC, Sentinel, and Patriot (through a Radar Interface Unit (RIU)) components connected via an Integrated Fire Control Relay, working in an integrated manner. Additional capabilities include the incorporation of IBCS functionality into Air Defense Airspace Management (ADAM) Cells, ADA Brigade Headquarters, Army Air and Missile Defense Command (AAMDC) Headquarters, and Indirect Fire Protection Capabilities (IFPC). Future additional capabilities include incorporation of Terminal High Altitude Area Defense (THAAD) batteries and other Army and Joint net-centric architectures to ensure compatibility.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605457A / <i>Army Integrated Air and Missile Defense (AIAMD)</i>	Project (Number/Name) S40 / <i>Army Integrated Air and Missile Defense</i>
<p>Key principles of the AIAMD acquisition approach are the following:</p> <ul style="list-style-type: none">- Migrate from system-based acquisition to component-based acquisition- Use system-of-systems acquisition approach with collaboration among AIAMD, PEO MS, PEO C3T, and Brigade Combat Team (BCT) Modernization Component Project Offices, Missile Defense Agency (MDA), and other Service Project Offices to network enable weapons and sensor components- Develop and procure common Army IAMD Battle Command System (IBCS) Engagement Operations Center (EOC) that replaces seven weapon system unique Battle Management Command, Control, Communications, Computers and Intelligence (BMC4I) components- Establish product lines used to evaluate and select, modify and integrate modular open systems hardware (HW) and software (SW) common configuration items- Conduct architecture-based System Engineering, Integration and Test (SEI&T) activities for an incremental fielded configuration of the AIAMD Integrated Fire Control (IFC) Network-compatible IBCS EOC, weapons and sensor system components		
E. Performance Metrics N/A		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605457A / Army Integrated Air and Missile Defense (AIAMD)				S40 / Army Integrated Air and Missile Defense							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	Various : Huntsville, AL	27.384	3.641	Oct 2016	4.853	Oct 2017	2.683	Oct 2018	-		2.683	Continuing	Continuing	Continuing
Subtotal			27.384	3.641		4.853		2.683		-		2.683	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Space and Missile Defense (ASMD) System of Systems (SOS) Hardware-in-the- Loop Testbed	C/CPFF	Various : Huntsville, AL and multiple other locations	17.697	-		-		-		-		-	0.000	17.697	-
AIAMD System Engineering & Integration	C/CPFF	Various : Huntsville, AL	124.703	28.115	Oct 2016	32.964	Oct 2017	27.880	Oct 2018	-		27.880	Continuing	Continuing	Continuing
IAMD Engineering Manufacturing and Development	C/CPIF	Northrop Grumman, Raytheon and Other : Huntsville, AL and Various other locations	981.383	138.539	Oct 2016	207.163	Oct 2017	170.614	Oct 2018	-		170.614	Continuing	Continuing	Continuing
Government Furnished Equipment	TBD	Various : Multiple	18.489	2.612	Oct 2016	7.482	Oct 2017	3.660	Oct 2018	-		3.660	Continuing	Continuing	Continuing
Government Systems Engineering and Logistics	TBD	Various : Huntsville, AL	57.812	14.813	Oct 2016	15.282	Oct 2017	15.952	Oct 2018	-		15.952	Continuing	Continuing	Continuing
Advanced Electronic Protection Enhancement (AEPE)	TBD	Various : TBD	21.000	-		-		-		-		-	0.000	21.000	-
Cyber Security	TBD	Huntsville, AL : TBD	23.000	15.000	Oct 2016	-		-		-		-	0.000	38.000	-
Rapid Threat	TBD	Huntsville, AL : TBD	-	15.000	Oct 2016	-		-		-		-	0.000	15.000	-
Subtotal			1,244.084	214.079		262.891		218.106		-		218.106	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605457A / <i>Army Integrated Air and Missile Defense (AIAMD)</i>	Project (Number/Name) S40 / <i>Army Integrated Air and Missile Defense</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Modeling and Simulation	[Blue bar spanning FY 2017 Q1 to FY 2023 Q4]																											
EMD Developmental Test	[Blue bar spanning FY 2017 Q1 to FY 2019 Q4]																											
EMD Continuation	[Blue bar spanning FY 2017 Q1 to FY 2020 Q4]																											
Milestone C (MS C) Decision	[Blue triangle '1' at FY 2020 Q4]																											
Initial Operational Test and Evaluation	[Blue bar spanning FY 2021 Q2 to FY 2021 Q4]																											
Initial Operational Capability (IOC)	[Blue triangle '2' at FY 2022 Q2]																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605457A / <i>Army Integrated Air and Missile Defense (AIAMD)</i>	Project (Number/Name) S40 / <i>Army Integrated Air and Missile Defense</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Modeling and Simulation	1	2013	4	2023
EMD Developmental Test	4	2014	4	2019
EMD Continuation	1	2016	4	2020
Milestone C (MS C) Decision	4	2020	4	2020
Initial Operational Test and Evaluation	4	2021	2	2022
Initial Operational Capability (IOC)	3	2022	3	2022

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605766A / <i>National Capabilities Integration (MIP)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	4.955	6.882	12.340	-	12.340	11.435	9.177	13.182	12.554	0.000	70.525
DX9: <i>National Integration To Tactical Systems(MIP)</i>	-	4.955	2.820	9.060	-	9.060	8.090	5.723	6.683	5.925	0.000	43.256
EX7: <i>Air Vigilance System Development</i>	-	0.000	4.062	3.280	-	3.280	3.345	3.454	6.499	6.629	0.000	27.269

Note

In FY 2018, PE 0605766A 'National Capabilities Integration (MIP) funds realign into two (2) separate projects:

- (1) Project DX9 National Integration To Tactical Systems (MIP)
- (2) Project EX7 Air Vigilance System Development

All funding is in support of the ACTIVE COMPONENT

A. Mission Description and Budget Item Justification

National Integration to Tactical Systems provides centralized monitoring and synchronization by the Army's Tactical Exploitation of National Capabilities (TENCAP) office, for the transition and integration of proven advanced technologies, prototypes and standards developed by the National Intelligence Community (IC) into Army systems and Programs of Record. This Program Element includes System Development and Integration funds for the Air Vigilance Program of Record (POR). It also enables efficient use and oversight of system development funds for final stage integration, development, and testing of successful technologies and prototypes to advance, or make compliant, Army systems and Programs of Record that have or use National capabilities.

B. Program Change Summary (\$ in Millions)	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	4.955	6.882	9.804	-	9.804
Current President's Budget	4.955	6.882	12.340	-	12.340
Total Adjustments	0.000	0.000	2.536	-	2.536
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Other Adjustments 1	-	-	2.536	-	2.536

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

Appropriation/Budget Activity
2040: *Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)*

R-1 Program Element (Number/Name)
PE 0605766A / *National Capabilities Integration (MIP)*

Change Summary Explanation

Fiscal Year (FY) 19 increase \$2.536 due to internal Army adjustments to meet emerging intelligence requirements.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605766A / <i>National Capabilities Integration (MIP)</i>			Project (Number/Name) DX9 / <i>National Integration To Tactical Systems(MIP)</i>				
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
DX9: <i>National Integration To Tactical Systems(MIP)</i>	-	4.955	2.820	9.060	-	9.060	8.090	5.723	6.683	5.925	0.000	43.256
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

National Integration to Tactical Systems provides for centralized monitoring and synchronization by the Army's Tactical Exploitation of National Capabilities (TENCAP) office for the transition and integration of new, updated, and emerging National Intelligence Community (IC) technologies, capabilities, and standards into Programs of Record across the Army to: (1) maintain operational relevance of Army programs and address changes in technology and the threat, (2) ensure Army programs maintain interoperability with and access to the National community architecture and systems, and (3) advance Army ability to conduct analysis and tasking, collection, processing, exploitation, dissemination and feedback (TCPEDF) of intelligence data.

FY 2019 Base funding in the amount of \$9.060 million provides integration funds for 3 validated National Intel Community (IC) effort: (1) Army TNG Integration, \$3.024 million funds the continued efforts to ensure Army Programs of Record are in compliance to the National standard for Airborne Overhead Cooperative Operations/Theater Net-Centric Geolocation (AOCO/TNG), per the Joint Requirement (JROCM 101-10); (2) AMDAS-Next, \$3.500 million funds the system development and integration efforts on the AMDAS-Next; and (3) TENCAP Radio Frequency Exploitation (TRFE), \$2.536 million funds the system development and integration efforts on the prototype kit.

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

	FY 2017	FY 2018	FY 2019
Title: Advanced Air Vigilance (AV) capabilities	2.352	-	-
Description: Advanced development, modifications and changes to the Air Vigilance (AV) system software.			
Title: Army TNG Integration - Airborne Overhead Cooperative Operations (AOCO) / Theater Net-Centric Geolocation (TNG)	2.603	2.820	3.024
Description: National Intelligence Community (IC) standard for interoperability and use of specific intelligence networked capabilities.			
FY 2018 Plans: Provides funds to specified Army Programs of Record (PORs) for final-stage software development and integration efforts, ensuring their compliance to the National requirement and standards that enables these PORs to be interoperable within this National Intelligence Community (IC) "Theater Net-Centric Geolocation (TNG)" network for joint tactical use and improved Army battlefield awareness. (ref. CJCSI 32450.61, AOCO 13Jan2012)			
FY 2019 Plans:			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / <i>National Capabilities Integration (MIP)</i>	Project (Number/Name) DX9 / <i>National Integration To Tactical Systems(MIP)</i>		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Provides funds to specified Army Programs of Record (PORs) for final-stage software development and integration efforts, ensuring their compliance to the National requirement and standards that enables these PORs to be interoperable within this National Intelligence Community (IC) "Theater Net-Centric Geolocation (TNG)" network for joint tactical use and improved Army battlefield awareness. (ref. CJCSI 32450.61, AOCO 13Jan2012) FY 2018 to FY 2019 Increase/Decrease Statement: Additional quantity of Army sensors to be made compliant to TNG standards and interoperable.				
Title: AMDAS-Next Description: System development and integration of the prototype Advanced Miniaturized Data Acquisition System 'AMDAS - Next', the subsystem that provides national data to the tactical warfighter via intelligence community partners classified national systems. FY 2019 Plans: Provides for the initial system integration and interoperability testing of the prototype subsystem AMDAS - Next as part of the Army's common intel architecture and operations, and as sensor-data ingest for Army Distributed Common Ground System (DCGS-A) program. FY 2018 to FY 2019 Increase/Decrease Statement: Previously funded as Advanced Development (BA 6.4 RDTE) level efforts progressing to System Development efforts.		-	-	3.500
Title: TENCAP Radio Frequency Exploitation (TRFE) Description: New prototype capability kit that targets modern digital communications systems employed by near-peer nation states armies and assist with Battlespace RF Characterization for modern communication environments with the intent to synchronize SIGINT, Cyber and Electronic Warfare operations. Utilizes commercial industry components and architectures to minimize hardware costs, risk and maximizes scalability/modularity. FY 2019 Plans: Initial integration of TRFE cognitive software based Electronic Warfare and Cyber Attack prototype capability focused on countering Peer State and modern communication targets and threats. FY 2018 to FY 2019 Increase/Decrease Statement: Initiates funds for system development and integration of TENCAP Radio Frequency Exploitation (TFRE) efforts ready for transition		-	-	2.536
Accomplishments/Planned Programs Subtotals		4.955	2.820	9.060

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / <i>National Capabilities Integration (MIP)</i>	Project (Number/Name) DX9 / <i>National Integration To Tactical Systems(MIP)</i>
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C. Other Program Funding Summary (\$ in Millions)

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• 0603766A: <i>Tactical Support Development - Adv Dev (MIP), PE 643766</i>	15.730	27.733	35.667	-	35.667	37.731	31.179	34.201	36.169	0.000	218.410

Remarks

D. Acquisition Strategy

The 'National Integration To Tactical Systems (Military Intelligence Program - MIP)' funds provide for transition and integration of National Intelligence Community (IC) advanced technologies and prototypes leveraged by the Army's Tactical Exploitation of National Capabilities (TENCAP) program office. The Army TENCAP acquisition strategy is driven by an annual TENCAP General Officer Steering Group (TGOSG), co-chaired by the Army G2; Army G8; and the Military Deputy to the Assistant Secretary of the Army for Acquisition, Logistics, and Technology [ASA(ALT)]; and includes representatives from the Army G3; Army G6; Army Training and Doctrine Command (TRADOC); and the Program Executive Office for Intelligence, Electronic Warfare and Sensors (PEO IEW&S). The TGOSG reviews, validates, prioritizes, and guides Army TENCAP efforts, according to Army and Defense strategy. Based on this TGOSG guidance, Army TENCAP invests BA 6.4 RDTE in Intelligence Community (IC) developments during the more cost-effective advanced development phase to ensure Army requirements are met with minimal redundancy with Army investments. Army TENCAP then uses BA 6.5 RDTE to manage the transition of these advanced development efforts through system development and integration into Army Programs of Record (POR). This strategy ensures these leveraged investments remain viable through multiple budget cycles, significantly increasing successful transition to recipient Army POR. Army TENCAP facilitates the continued access to National Intel Community (IC) 'joint' efforts and compatibility with those National standards and software baseline for those Army PORs that benefit from these leveraged National IC technologies, resulting in cost-savings through cost-sharing, and Army participation in collaborative Intelligence. Funds will be used for final-stage integration efforts identified and vetted through the Army TENCAP annual TGOSG, such as: advanced Air Vigilance software enhancements; POR sensor integration into the Theater Net-Centric Geolocation network; integration of the future Advanced Miniaturized Data Acquisition System (AMDAS - Next) capability into PM DCGS-A family of systems and operational concepts; transition and integration of Army TENCAP technologies discovered and leveraged by the annual Military Exploitation of Reconnaissance and Intelligent Technology (MERIT) project selection process, as well as other transitioning technologies discovered and/or leverage through other joint TENCAP outreach efforts.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / <i>National Capabilities Integration (MIP)</i>	Project (Number/Name) DX9 / <i>National Integration To Tactical Systems(MIP)</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
AV POR Matrix Engineers	MIPR	Classified : Alexandria, VA	0.603	0.660	Jan 2017	-		-		-		-	0.000	1.263	Continuing
AV POR Intel Engineers, PM Support	C/FFPLOE	Engility Corp : Chantilly, VA	2.140	-		-		-		-		-	0.000	2.140	Continuing
TNG Engineers	MIPR	Multiple : Multiple	-	-		0.420		0.913	Jan 2019	-		0.913	0.000	1.333	Continuing
Subtotal			2.743	0.660		0.420		0.913		-		0.913	0.000	4.736	N/A

Remarks
Activities for AV POR realign to Project EX7 in FY18.

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Air Vigilance (AV) software updates and integration	MIPR	Classified : Classified	14.541	0.612	Jan 2017	-		-		-		-	0.000	15.153	Continuing
TNG for Multiple Army PORs	MIPR	Multiple : Multiple	24.370	2.603	Jan 2017	1.905		4.782		-		4.782	0.000	33.660	Continuing
TRFE	MIPR	Classified : Classified	-	-		-		2.336	Jan 2019	-		2.336	0.000	2.336	Continuing
Subtotal			38.911	3.215		1.905		7.118		-		7.118	0.000	51.149	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Air Vigilance (AV) PM Dir costs - Gov, travel, etc.	Allot	Army TENCAP : Alexandria, VA	3.709	0.830	Jan 2017	-		-		-		-	0.000	4.539	Continuing
TNG Support Costs	Allot	PEO IEW&S/PM SAI : Aberdeen Proving Grounds, MD	-	-		0.240		0.554		-		0.554	0.000	0.794	Continuing

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / <i>National Capabilities Integration (MIP)</i>	Project (Number/Name) DX9 / <i>National Integration To Tactical Systems(MIP)</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Theater Net-centric Geolocation (TNG) Interoperability Standard	[Redacted]																															
AMDAS Next Integration into PM DCGS-A Family of Systems	[Redacted]								[Redacted]								[Redacted]								[Redacted]							
TRFE Prototype Integration Effort	[Redacted]								[Redacted]								[Redacted]								[Redacted]							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / <i>National Capabilities Integration (MIP)</i>	Project (Number/Name) DX9 / <i>National Integration To Tactical Systems(MIP)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Theater Net-centric Geolocation (TNG) Interoperability Standards	2	2014	1	2023
AMDAS Next Integration into PM DCGS-A Family of Systems	2	2019	4	2021
TRFE Prototype Integration Effort	2	2019	1	2024

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605766A / <i>National Capabilities Integration (MIP)</i>				Project (Number/Name) EX7 / <i>Air Vigilance System Development</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
<i>EX7: Air Vigilance System Development</i>	-	0.000	4.062	3.280	-	3.280	3.345	3.454	6.499	6.629	0.000	27.269
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The FY 2018 funds realigned from Project DX9 'National Integration To Tactical Systems(MIP) to Project EX7 'Air Vigilance System Development'.

A. Mission Description and Budget Item Justification

Air Vigilance systems are a software based solution that collect critical intelligence data on emerging threat aerial systems. The intelligence data provides early warning of operations in restricted airspace to ensure force protection. An Air Vigilance system is comprised of a server unit configured and fielded with a single or multiple sub-component sensors. System Quantities are based upon server units. Operational details are classified.

FY 2019 Base funding in the amount of \$3.280 million provides for system development and integration of latest software developments and hardware configurations in accordance with Capability Drop (CD) 3 requirements

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

	FY 2017	FY 2018	FY 2019
Title: Air Vigilance System Development and Integration	-	4.062	3.280
Description: Software and hardware engineering, development and integration efforts.			
FY 2018 Plans: Provides for software development and integration to ingest latest collected sensor data into the common baseline and enhance system capabilities to meet newly identified threats and latest Capability Drop requirements.			
FY 2019 Plans: Provides for software development and integration to ingest latest collected sensor data into the common baseline and enhance system capabilities to meet newly identified threats and latest Capability Drop requirements.			
FY 2018 to FY 2019 Increase/Decrease Statement: System development driven by and in response to collected sensor data.			
Accomplishments/Planned Programs Subtotals	-	4.062	3.280

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / <i>National Capabilities Integration (MIP)</i>	Project (Number/Name) EX7 / <i>Air Vigilance System Development</i>

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

Line Item	FY 2017	FY 2018	FY 2019	FY 2019	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	Cost To	
			Base	OCO	Total					Complete	Total Cost
• 0603766A: <i>Tactical Support Development - Adv Dev (MIP)</i>	15.730	27.733	35.667	-	35.667	37.731	31.179	34.201	36.169	0.000	218.410
• W60001: <i>Air Vigilance (AV), OPA2 (W60001)</i>	0.733	5.348	8.497	-	8.497	8.953	8.169	8.530	8.701	Continuing	Continuing

Remarks

D. Acquisition Strategy

Air Vigilance (AV) is an ACAT III Automated Information System (AIS) program of record (POR) that originated from a Quick Reaction Capability (QRC) developed and fielded cooperatively with the Intelligence Community (IC) through the efforts and mission of the Army's Tactical Exploitation of National Capabilities (TENCAP) office. The QRC was transitioned into an Army AIS POR by the AAE in May 2013 and assigned to Army Program Executive Office - Intelligence Electronic Warfare and Sensors (PEO IEWS), the chartered acquisition authority for management and execution of the Army's TENCAP mission and Milestone Decision Authority (MDA) for the AV POR. The Army TENCAP continues to leverage the IC common software development and support contract to field the AV systems, and ensure this primarily software based system can continue to access and leverage the common software, and input or ingest the latest sensor collects into the common IC data library. As an AIS POR, the AV POR is currently fielding systems per its Basis of Issue Plan (BOIP) and with software and system capabilities that meet its latest validated Capability Drop (CD) requirements. The AV POR is currently scheduled to meet Full Deployment (FD) by 2021, and will continue to evolve to meet future validated Capability Drop requirements and maintain its effectiveness against emerging threats.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0605766A / National Capabilities Integration (MIP)				EX7 / Air Vigilance System Development							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineers and Technical Assistance (SETA)	Option/FFPLOE	Engility Corp : Alexandria, VA	-	-		0.480		0.510		-		0.510	0.000	0.990	Continuing
Subtotal			-	-	0.480		0.510		-		0.510	0.000	0.990	N/A	
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Vigilance software updates and integration	MIPR	Classified : Classified	-	-		2.588		1.825		-		1.825	0.000	4.413	Continuing
Subtotal			-	-	2.588		1.825		-		1.825	0.000	4.413	N/A	
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
DA Gov Salaries, Travel, Office Costs	Allot	PEO IEWS/Air Vigilance POR : Alexandria, VA	-	-		0.744		0.830		-		0.830	0.000	1.574	Continuing
Subtotal			-	-	0.744		0.830		-		0.830	0.000	1.574	N/A	
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Vigilance system Testing and Exercises	MIPR	Classified : Classified	-	-		0.250		0.115		-		0.115	0.000	0.365	-
Subtotal			-	-	0.250		0.115		-		0.115	0.000	0.365	N/A	

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army									Date: February 2018			
Appropriation/Budget Activity 2040 / 5				R-1 Program Element (Number/Name) PE 0605766A / <i>National Capabilities Integration (MIP)</i>				Project (Number/Name) EX7 / <i>Air Vigilance System Development</i>				
	Prior Years	FY 2017	FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-	4.062		3.280		-		3.280	0.000	7.342	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / <i>National Capabilities Integration (MIP)</i>	Project (Number/Name) EX7 / <i>Air Vigilance System Development</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
Air Vigilance Capability Drop #3 - APRB defined SW, HW requirement				▲ 1																												
AV system development, integration and fielding contract																																
Air Vigilance CD #3 National Assessment Group Test					▲ 2																											
Full Deployment - Current RDP s/w Baseline																	▲ 4 FD															
RFP - Leveraging Intel Community Contract									▲ 3 RFP																							
AV s/w, h/w dev, integration and fielding - Follow-on capabilities																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / <i>National Capabilities Integration (MIP)</i>	Project (Number/Name) EX7 / <i>Air Vigilance System Development</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Air Vigilance Capability Drop #3 - APRB defined S/W, H/W requirement	4	2017	4	2017
AV system development, integration and fielding contract	2	2016	2	2021
Air Vigilance CD #3 National Assessment Group Test	3	2018	3	2018
Full Deployment - Current RDP s/w Baseline	2	2021	2	2021
RFP - Leveraging Intel Community Contract	3	2019	3	2019
AV s/w, h/w dev, integration and fielding - Follow-on capabilities	4	2020	1	2026

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0605812A / Joint Light Tactical Vehicle - ED
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	11.086	23.467	2.686	-	2.686	2.732	1.744	2.789	4.799	Continuing	Continuing
VU9: Joint Light Tactical Vehicle - ED	-	11.086	23.467	2.686	-	2.686	2.732	1.744	2.789	4.799	Continuing	Continuing

Note

FY 2012 funding for the Joint Light Tactical Vehicles (JLTV) program is under Program Element (PE) 0604804A, Project L50.
 FY 2013 and out year funding is under Project Element (PE) 0605812A, Project VU9.

A. Mission Description and Budget Item Justification

Funding supports the development and testing of the JLTV Family of Vehicles (FoV). JLTV is a joint program between the U.S. Army and the U.S. Marine Corps, of which the U.S. Army is the lead service. The JLTV goal is a FoV capable of performing multiple mission roles designed to provide protected, sustained, and networked mobility for personnel and payloads across the full Range of Military Operations (ROMO). JLTV objectives include increased performance, protection, and payload over the current legacy HMMWV fleet, minimizing ownership costs by maximizing commonality, fuel efficiency and reliability. The commonality of components, maintenance procedures, training, etc., among vehicles is expected to be inherent in FoV solutions across mission variants to minimize total ownership cost. Unique service requirements have been minimized.

Major FY19 budget activities include test asset disposal, PM support, and Science and Technology funding to explore and develop integration solutions for Government Furnished Equipment (GFE) on the JLTV platform, along with operational efficiency solutions.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	11.530	23.467	3.056	-	3.056
Current President's Budget	11.086	23.467	2.686	-	2.686
Total Adjustments	-0.444	0.000	-0.370	-	-0.370
• Congressional General Reductions	-0.006	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.438	-			
• Adjustments to Budget Years	-	-	-0.370	-	-0.370

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

Appropriation/Budget Activity
2040: *Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)*

R-1 Program Element (Number/Name)
PE 0605812A / *Joint Light Tactical Vehicle - ED*

Change Summary Explanation

FY19 decrease of \$370K is due to an adjustment for PEO Direct and Reimbursable Manpower/Funding Restructure and economic adjustment for inflation.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605812A / Joint Light Tactical Vehicle - ED				Project (Number/Name) VU9 / Joint Light Tactical Vehicle - ED			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
VU9: Joint Light Tactical Vehicle - ED	-	11.086	23.467	2.686	-	2.686	2.732	1.744	2.789	4.799	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

FY 2012 funding for the Joint Light Tactical Vehicles (JLTV) program is under Program Element (PE) 0604804A, Project L50. FY 2013 and out year funding is under Project Element (PE) 0605812A, Project VU9.

A. Mission Description and Budget Item Justification

Funding supports the development and testing of the JLTV Family of Vehicles (FoV). JLTV is a joint program between the U.S. Army and the U.S. Marine Corps, of which the U.S. Army is the lead service. The JLTV goal is a FoV capable of performing multiple mission roles designed to provide protected, sustained, and networked mobility for personnel and payloads across the full Range of Military Operations (ROMO). JLTV objectives include increased performance, protection, and payload over the current legacy HMMWV fleet, minimizing ownership costs by maximizing commonality, fuel efficiency and reliability. The commonality of components, maintenance procedures, training, etc., among vehicles is expected to be inherent in FoV solutions across mission variants to minimize total ownership cost. Unique service requirements have been minimized.

Major FY19 budget activities include test asset disposal, PM support, and Science and Technology funding to explore and develop integration solutions for Government Furnished Equipment (GFE) on the JLTV platform, along with operational efficiency solutions.

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

	FY 2017	FY 2018	FY 2019
Title: Contract and support for development, fabrication, and test of live fire test assets.	-	4.109	-
Description: Funding is provided for the contract award for live fire test assets.			
FY 2018 Plans: Funding is provided for completion of LRIP Contractor Test Support Contract Award.			
FY 2018 to FY 2019 Increase/Decrease Statement: Decrease in FY18 to FY19 is the result of completion of LRIP Contract Award.			
Title: Joint Light Tactical Vehicles (JLTV) program management support	3.938	1.432	0.250
Description: Funding is provided for the support of program management government operations.			

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605812A / Joint Light Tactical Vehicle - ED	Project (Number/Name) VU9 / Joint Light Tactical Vehicle - ED

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>FY 2018 Plans: Continue support for LRIP phase to include monitoring of vendor performance and program management.</p> <p>FY 2019 Plans: Continuation of support for program management for Science and Technology events.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Decrease in program management support between FY2018 and FY2019 resulted from the conclusion of planned test events in accordance with the approved program Test and Evaluation Master Plan.</p>			
<p>Title: Test and Evaluation Events and Analysis.</p> <p>Description: Test and Evaluation Events</p> <p>FY 2018 Plans: Completion of logistics provisioning and publications. Completion of the Low-Rate Initial Production (LRIP) test program required events such as: Full Up System Level (FUSL) test, Multi-Service Operational Test and Evaluation (MOT&E), Automatic Fire Extinguishing System (AFES) test, and Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) test.</p> <p>FY 2019 Plans: Disposal of test vehicles/assets from the FUSL, AFES, and Corrosion testing.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Decrease in test and evaluation events between FY18 and FY19 resulted from the conclusion of planned test events in accordance with the approved program Test and Evaluation Master Plan.</p>	7.148	12.249	0.093
<p>Title: Science and Technology Updates.</p> <p>Description: Funding is provided for the support of JLTV science and technology updates.</p> <p>FY 2018 Plans: Science and Technology funds will be used to explore Acoustic and Thermal signature mitigation technology along with research into potential fuel economy savings.</p> <p>FY 2019 Plans: Science and Technology funds will be used to explore and develop integration solutions for Government Furnished Equipment (GFE) on the JLTV platform, along with operational efficiency solutions.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p>	-	5.677	2.343

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605812A / Joint Light Tactical Vehicle - ED	Project (Number/Name) VU9 / Joint Light Tactical Vehicle - ED

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
Decrease of Science and Technology is due to leaving the Low Rate Initial Production (LRIP) Phase and entering in the Full Rate Production (FRP) Phase.			
Accomplishments/Planned Programs Subtotals	11.086	23.467	2.686

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

Line Item	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
• D15603: JOINT LIGHT TACTICAL VEHICLE	587.514	804.440	1,319.436	-	1,319.436	1,147.246	1,242.725	1,346.783	1,211.192	0.000	7,659.336

Remarks

JLTV is a Joint Program with the United States Marine Corps (USMC)

Marine Corps Ground Combat/Support Systems, Production 5095 - FY17: 104,230 FY18: 233,639 FY19: 607,011 FY20: 707,778 FY21: 475,381 FY22: 439,744 FY23: 421,609

Marine Corps Ground Combat/Support Systems, RDTE Project 3209 0605813M- FY17: 0 FY18: 20,710 FY19: 2,260 FY20: 2,122 FY21: 26 FY22: 24 FY23: 22

Marine Corps Ground Combat Support Systems, RDTE Project 3209 0605812M- FY17: 7,657

D. Acquisition Strategy

Joint Light Tactical Vehicle (JLTV) is a Joint Service Program with the U.S. Army and U.S. Marine Corps as the two main components. The U.S. Army is the JLTV service lead.

The JLTV Program entered the Production and Deployment Phase with the Acquisition Decision Memorandum authorization on 25 August 2015. With Milestone C approval, the LRIP fixed price contract was awarded to Oshkosh Defense LLC on 25 August 2015. This contract consists of a three year LRIP period with options for five additional years of FRP deliveries. JPO JLTV requested separately priced firm fixed price (FFP) option(s) for purchase of the Technical Data Package (TDP) with appropriate data rights to allow for possible future competition for production vehicles and spares.

During the LRIP phase, JPO JLTV will continue to produce production vehicles for extensive Test and Evaluation activities to support a Full Rate Production (FRP) decision. A ramp up of JLTV quantities will continue thru FY19 to support fielding to U.S. Army and USMC units once the FRP decision is achieved and allow the program to transition into FRP.

The JLTV program will continually monitor emerging technologies and capabilities through its partnerships with U.S. Army and Marine Corps science and technology organizations as well as through industry market research and partnerships. At this time follow-on increments for technology insertion are undefined; the JLTV program will look for opportunities to implement increased capabilities throughout the systems Life Cycle.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605812A / <i>Joint Light Tactical Vehicle - ED</i>	Project (Number/Name) VU9 / <i>Joint Light Tactical Vehicle - ED</i>

<u>E. Performance Metrics</u> N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605812A / Joint Light Tactical Vehicle - ED	Project (Number/Name) VU9 / Joint Light Tactical Vehicle - ED
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Light Tactical Vehicles (JLTV) Contract Service Support	SS/CPFF	Booz-Allen Hamilton, : McLean, VA	10.191	-		-		-		-		-	0.000	10.191	-
JLTV Contract Service Support for Cost Analysis for JLTV CARD	SS/CPFF	Camber Corporation, : Huntsville, AL	0.591	-		-		-		-		-	0.000	0.591	-
JLTV Service Support	MIPR	US Army Combined Arms Support Commands - CASCOM, : Ft. Lee, VA	0.200	-		-		-		-		-	0.000	0.200	-
Subtotal			10.982	-		-		-		-		-	0.000	10.982	N/A

Remarks
Funding for Management Services has shifted from RDT&E to procurement.

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
JLTV Live Fire Test Support	C/FFP	Oshkosh Corporation : Oshkosh, WI	19.091	-		2.609		-		-		-	Continuing	Continuing	Continuing
Science and Technology Updates	C/TBD	To Be Determined : To Be Determined	-	-		5.677		2.343	Jul 2019	-		2.343	0.000	8.020	-
Subtotal			19.091	-		8.286		2.343		-		2.343	Continuing	Continuing	N/A

Remarks
Joint Light Tactical Vehicles (JLTV) is a Joint Services Program with the U.S. Army and U.S. Marine Corps as the two main components. U.S. Army under PE 0605812A, Project VU9, and the U.S. Marine Corps under PE 0605812M, Project 3209. The LRIP/FRP contract awarded in FY15 has a cost sharing agreement between the services to cover shared RDT&E funded test activities. Funding for Live Fire Test Assets decreases as Live Fire Testing is completed and the program moves toward a Full Rate Program (FRP) decision.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605812A / Joint Light Tactical Vehicle - ED	Project (Number/Name) VU9 / Joint Light Tactical Vehicle - ED
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Light Tactical Vehicles (JLTV) Program Management Support	Various	TACOM Life Cycle Management Command (LCMC), : Harrison Township, MI	27.632	3.938	Oct 2016	1.432		0.250	Oct 2018	-		0.250	Continuing	Continuing	Continuing
GFE Management / GFE / Integration	MIPR	Various : TBD	18.504	-		1.500		-		-		-	Continuing	Continuing	Continuing
JLTV EMD/LRIP phase.	MIPR	Tank-Automotive Reseach, Development, and Engineering Center - TARDEC : Warren, MI	14.245	-		-		-		-		-	Continuing	Continuing	Continuing
JLTV Prototype EMD/LRIP - Budget	MIPR	TACOM Life Cycle Management Command (LCMC), : Warren, MI	12.383	-		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			72.764	3.938		2.932		0.250		-		0.250	Continuing	Continuing	N/A

Remarks
Funding for Support Costs decreases due to the end of the development phase as well as programmatic support shifting from RDT&E to procurement.

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Complete Engineering and Manufacturing Development (EMD) Test - Limited User Test (LUT)	MIPR	Army Evaluation Center (AEC) : Aberdeen Proving Ground, MD	41.342	-		-		-		-		-	0.000	41.342	-
Development Testing, MOT&E and Live Fire T&E - ballistics, FUSL, AFES, Log demo and corrosion.	Various	TBD : Various	27.750	7.148	Dec 2017	12.249		0.093	Jun 2019	-		0.093	23.708	70.948	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605812A / Joint Light Tactical Vehicle - ED	Project (Number/Name) VU9 / Joint Light Tactical Vehicle - ED
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Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			69.092	7.148		12.249		0.093		-		0.093	23.708	112.290	N/A

Remarks
Funding for Government Test Support increases from FY17 to FY18 to support the Operational Test and Evaluation Event scheduled for the second quarter of FY18.

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	171.929	11.086	23.467	2.686	-	2.686	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605812A / Joint Light Tactical Vehicle - ED	Project (Number/Name) VU9 / Joint Light Tactical Vehicle - ED

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023									
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4						
Test Vehicles and LRIP Contract	[Redacted]																																	
Full Up Systems Level (FUSL) Test	[Redacted]																																	
Logistics Demonstration			[Redacted]																															
Multi-Service Operational Test and Evaluation (MOT&E)					[Redacted]																													
Full-Rate Production (FRP) Decision									1 FRP																									
Army Initial Operating Capability (IOC)															3																			
Army First Unit Equipped (FUE)										2																								

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605812A / <i>Joint Light Tactical Vehicle - ED</i>	Project (Number/Name) VU9 / <i>Joint Light Tactical Vehicle - ED</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Test Vehicles and LRIP Contract	4	2015	1	2019
Full Up Systems Level (FUSL) Test	2	2017	1	2018
Logistics Demonstration	3	2017	4	2017
Multi-Service Operational Test and Evaluation (MOT&E)	2	2018	3	2018
Full-Rate Production (FRP) Decision	1	2019	1	2019
Army Initial Operating Capability (IOC)	1	2020	1	2020
Army First Unit Equipped (FUE)	2	2019	2	2019

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0605830A / <i>Aviation Ground Support Equipment</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	2.060	6.930	2.706	-	2.706	5.430	2.938	4.775	4.672	0.000	29.511
EE5: <i>Aviation Ground Support Equipment</i>	-	2.060	6.930	2.706	-	2.706	5.430	2.938	4.775	4.672	0.000	29.511

A. Mission Description and Budget Item Justification

This Program Element funds Aviation Ground Support Equipment (AGSE) developmental testing and acquisition of prototypes to enhance the functionality of current and future aircraft maintenance equipment. This will be accomplished by identifying more effective aircraft maintenance equipment, validating new maintenance concepts, improving machine interfaces, updating aircraft maintenance processes, and developing improved diagnostic technologies which will reduce Operation and Support costs. This program provides for the development of rapid battle repair procedures, tools, ground handling, and test equipment to speed the return of aircraft to a fully mission capable status. Included in this program are: Tool Set, Aviation Unit Maintenance (TS, AUM) (formerly Aviation Unit Maintenance Shop Set), Self-propelled Crane Aircraft Maintenance and Positioning Increment II (SCAMP II) Type 2 (Expeditionary Variant) & Type 1 (Flight Line Variant), Pitot Static Test Set (PSTS), and development of support equipment required for maintenance of modernized/future force aircraft.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	2.142	6.930	4.255	-	4.255
Current President's Budget	2.060	6.930	2.706	-	2.706
Total Adjustments	-0.082	0.000	-1.549	-	-1.549
• Congressional General Reductions	-0.001	-	-	-	-
• Congressional Directed Reductions	-	-	-	-	-
• Congressional Rescissions	-	-	-	-	-
• Congressional Adds	-	-	-	-	-
• Congressional Directed Transfers	-	-	-	-	-
• Reprogrammings	-	-	-	-	-
• SBIR/STTR Transfer	-0.081	-	-	-	-
• Adjustments to Budget Years	-	-	-1.549	-	-1.549

Change Summary Explanation

FY19 reflects HQDA realignments to other programs (-\$1.037 million) and realignment of reimbursable manpower funding to direct manpower funding (-\$0.512 million).

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605830A / Aviation Ground Support Equipment				Project (Number/Name) EE5 / Aviation Ground Support Equipment			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EE5: Aviation Ground Support Equipment	-	2.060	6.930	2.706	-	2.706	5.430	2.938	4.775	4.672	0.000	29.511
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element funds Aviation Ground Support Equipment (AGSE) developmental testing and acquisition of prototypes to enhance the functionality of current and future aircraft maintenance equipment. This will be accomplished by identifying more effective aircraft maintenance equipment, validating new maintenance concepts, improving machine interfaces, updating aircraft maintenance processes, and developing improved diagnostic technologies which will reduce Operation and Support costs. This program provides for the development of rapid battle repair procedures, tools, ground handling, and test equipment to speed the return of aircraft to a fully mission capable status. Included in this program are: Tool Set, Aviation Unit Maintenance (TS, AUM) (formerly Aviation Unit Maintenance Shop Set), Self-propelled Crane Aircraft Maintenance and Positioning Increment II (SCAMP II) Type 2 (Expeditionary Variant) & Type 1 (Flight Line Variant), Pitot Static Test Set (PSTS), and development of support equipment required for maintenance of modernized/future force aircraft.

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

	FY 2017	FY 2018	FY 2019
<p>Title: Tool Set, Aviation Unit Maintenance</p> <p>Description: The Tool Set, Aviation Unit Maintenance consists of three deployable shelters which provide tool loads required for unit-level aviation maintenance tasks.</p> <p>FY 2018 Plans: Develop solution for transporting the one-sided expandable International Organization for Standardization (ISO) shelters.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Transition to procurement and fielding of MWO.</p>	0.910	1.000	-
<p>Title: SCAMP II, Type 2 (Expeditionary Variant)</p> <p>Description: The SCAMP II, Type 2 will remove and replace major aircraft components (maintenance lifting) in support of Army Aviation Maintenance. Type 2 supports maintenance on unimproved, austere locations, split operations and downed aircraft recovery.</p> <p>FY 2018 Plans: Prepare acquisition documentation in support of Milestone C.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p>	0.457	1.403	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605830A / Aviation Ground Support Equipment	Project (Number/Name) EE5 / Aviation Ground Support Equipment		
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2017	FY 2018	FY 2019
Transition to procurement and fielding.				
Title: SCAMP II, Type 1 (Flight Line Variant)		-	2.906	-
Description: SCAMP II, Type 1 will remove and replace major aircraft components (maintenance lifting) in support of Army Aviation Maintenance. Type 1 is used on improved surfaces and will lift and reach the most extreme loads.				
FY 2018 Plans: Evaluate capability enhancements to legacy system and begin updating the technical manual to current Military Standards.				
FY 2018 to FY 2019 Increase/Decrease Statement: Plans for requirement to consolidate in the procurement of SCAMP II, Type 2				
Title: Pitot Static Test Set (PSTS)		-	0.946	2.706
Description: PSTS is a portable aircraft air data systems tester which provides the capability of troubleshooting, repairing, and verifying proper operation of flight critical aircraft air data systems.				
FY 2018 Plans: Procure product test samples and conduct testing.				
FY 2019 Plans: Conduct Acceptance Tests and Airworthiness Release.				
FY 2018 to FY 2019 Increase/Decrease Statement: Requirement increase to complete testing, Tech Manual development and verification.				
Title: Management Support Services		0.321	0.304	-
Description: Management Support Services in support of the Aviation Ground Support Equipment Product Management Office.				
FY 2018 Plans: Continue Management Support Services.				
FY 2018 to FY 2019 Increase/Decrease Statement: Manpower moved to direct OMA funding.				
Title: Research, Development, Test, and Evaluation (RDTE) Project Test Support		0.062	-	-
Description: RDTE Project Test Support for the Aviation Ground Support Equipment Product Management Office.				
Title: Technical Engineering Services		0.310	0.371	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army	Date: February 2018
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Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605830A / Aviation Ground Support Equipment	Project (Number/Name) EE5 / Aviation Ground Support Equipment
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019
<p>Description: Technical Engineering Services in support of Airworthiness and Safety certifications for Aviation Ground Support Equipment.</p> <p>FY 2018 Plans: Continue Technical Engineering Services</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Manpower moved to direct OMA funding.</p>			
Accomplishments/Planned Programs Subtotals	2.060	6.930	2.706

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u> <u>Base</u>	<u>FY 2019</u> <u>OCO</u>	<u>FY 2019</u> <u>Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• AZ3520: AVIATION GROUND SUPPORT EQUIPMENT	48.234	47.404	34.818	-	34.818	34.543	31.720	32.652	33.360	0.000	262.731

Remarks

D. Acquisition Strategy

This project is an aggregate of aviation ground support equipment related projects. While the detailed acquisition strategy varies from program to program, the general strategy for each individual program is to complete the development effort through Government test (developmental and operational). Program documentation for each milestone decision is prepared, as appropriate, concurrently with the development effort.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605830A / Aviation Ground Support Equipment	Project (Number/Name) EE5 / Aviation Ground Support Equipment
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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 Support Services	Various	PM AGSE : Redstone Arsenal, AL	0.656	0.321	Oct 2016	0.304	Oct 2017	-		-		-	0.000	1.281	-
Subtotal			0.656	0.321		0.304		-		-		-	0.000	1.281	N/A

Remarks
None.

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Tool Set, Aviation Unit Maintenance	Various	AMRDEC, RSA; RTTC, RSA; Aberdeen Test Center, : Aberdeen Proving Ground, MD	3.681	0.910	Jul 2017	1.000		-		-		-	0.000	5.591	-
SCAMP II, Type 2 (Expeditionary)	Various	AMCOM, RSA; AMRDEC, RSA : Redstone Arsenal, AL	0.721	0.457	Jul 2017	1.403		-		-		-	0.000	2.581	-
SCAMP II, Type 1 (Flight Line)	Various	AMCOM, RSA; AMRDEC, RSA : Redstone Arsenal, AL	-	-		2.906		-		-		-	0.000	2.906	-
PSTS	C/TBD	TBD : TBD	-	-		0.946		2.706	Apr 2019	-		2.706	Continuing	Continuing	Continuing
Subtotal			4.402	1.367		6.255		2.706		-		2.706	Continuing	Continuing	N/A

Remarks
None.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605830A / Aviation Ground Support Equipment	Project (Number/Name) EE5 / Aviation Ground Support Equipment
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Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Technical Engineering Services	MIPR	AATD : Ft. Eustis, VA	0.556	0.200	Apr 2017	0.300	Apr 2018	-		-		-	0.000	1.056	-
Technical Engineering Services	MIPR	AED : Redstone Arsenal, AL	0.237	0.110	Apr 2017	0.071	Apr 2018	-		-		-	0.000	0.418	-
Subtotal			0.793	0.310		0.371		-		-		-	0.000	1.474	N/A

Remarks
None.

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Lakota NGHMS Demo	MIPR	ATC : Aberdeen Proving Ground, MD	0.420	-		-		-		-		-	0.000	0.420	-
Lakota NGHMS Demo	Various	AMRDEC : Redstone Arsenal, AL	0.190	-		-		-		-		-	0.000	0.190	-
Lakota NGHMS	Various	AMRDEC : Redstone Arsenal, AL	4.825	-		-		-		-		-	0.000	4.825	-
AGSE Test Support	Various	AMCOM, : Redstone Arsenal, AL	0.055	0.062	Jan 2017	-		-		-		-	0.000	0.117	-
Subtotal			5.490	0.062		-		-		-		-	0.000	5.552	N/A

Remarks
None.

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	11.341	2.060	6.930	2.706	-	2.706	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605830A / Aviation Ground Support Equipment	Project (Number/Name) EE5 / Aviation Ground Support Equipment

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023							
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
AGPU Next Gen.																																
Tool Set, Aviation Unit Maintenance (TS, AUM)																																
Self-Propelled Crane Aircraft Maintenance and Positioning II, Type 2																																
Self-Propelled Crane Aircraft Maintenance and Positioning II, Type 1																																
Pitot Static Test Set (PSTS)																																
Aircraft Cleaning and Deicing System (ACDS)																																
Shop Equipment Contact Maintenance (SECM)																																
Aviation Intermediate Maintenance Shop Set																																
Common Aviation Tool System																																
Generic Aircraft Nitrogen Generator																																
Standard Aircraft Towing System																																

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605830A / Aviation Ground Support Equipment	Project (Number/Name) EE5 / Aviation Ground Support Equipment

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
AGPU Next Gen.	2	2020	4	2023
Aviation Unit Maintenance Shop Set (AVUM SS)	3	2015	4	2016
Tool Set, Aviation Unit Maintenance (TS, AUM)	4	2016	2	2019
Self-Propelled Crane Aircraft Maintenance and Positioning II, Type 2	3	2015	4	2019
Self-Propelled Crane Aircraft Maintenance and Positioning II, Type 1	3	2018	4	2018
Pitot Static Test Set (PSTS)	2	2018	4	2019
Aircraft Cleaning and Deicing System (ACDS)	1	2022	3	2023
Shop Equipment Contact Maintenance (SECM)	2	2020	4	2021
Aviation Intermediate Maintenance Shop Set	2	2023	4	2024
Common Aviation Tool System	2	2023	4	2024
Generic Aircraft Nitrogen Generator	3	2023	4	2024
Standard Aircraft Towing System	4	2023	4	2024

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>					R-1 Program Element (Number/Name) PE 0210609A / <i>Paladin Integrated Management (PIM)</i>							
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	39.902	6.112	0.000	-	0.000	0.000	0.000	0.000	9.406	0.000	55.420
ED8: <i>Paladin Integrated Management (PIM)</i>	-	39.902	6.112	0.000	-	0.000	0.000	0.000	0.000	9.406	0.000	55.420

A. Mission Description and Budget Item Justification

Paladin Integrated Management (PIM) is an ACAT 1C Acquisition Program. The program will replace the current fleet of M109 Family of Vehicles (FoV) consisting of the M109A6 Paladin Self Propelled Howitzer and M992A2 Field Artillery Ammunition Supply Vehicle (FAASV). PIM is an Army Modernization Program that addresses a critical capability gap created by the Non-Line of Sight Cannon termination in June of 2009 as well as obsolescence and Space, Weight, and Power (SWAP) issues in the M109 FoV current fleet. The PIM system integrates current Bradley Fighting Vehicle suspension and drive train items, Future Combat Systems (FCS) developed Electric Gun Drive systems and current fleet (M109A6) fire control systems into a new chassis providing better force protection, survivability and increases in electrical power over the current fleet. PIM is a two vehicle system: The M109A7 Self Propelled Howitzer (SPH) and the M992A3 Carrier Ammunition Tracked (CAT). The SPH has all characteristics listed above. The CAT utilizes all of these same components and traits except those related directly to the cannon system. The PIM system replaces the current M109 FoV on a one for one basis, in the cannon fires battalions in the Armored Brigade Combat Team Formations and the Echelons above Brigade (EAB). The overall intent is to increase Soldier force protection, vehicle survivability, provide an appropriate amount of SWAP capacity to add future capabilities, increase vehicle reliability, reduce life cycle costs and extend the life of the M109 FoV through FY 2050.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	41.498	6.112	0.000	-	0.000
Current President's Budget	39.902	6.112	0.000	-	0.000
Total Adjustments	-1.596	0.000	0.000	-	0.000
• Congressional General Reductions	-0.020	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.576	-			

Change Summary Explanation

No funding in FY19

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0210609A / <i>Paladin Integrated Management (PIM)</i>				Project (Number/Name) ED8 / <i>Paladin Integrated Management (PIM)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
ED8: <i>Paladin Integrated Management (PIM)</i>	-	39.902	6.112	0.000	-	0.000	0.000	0.000	0.000	9.406	0.000	55.420
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Paladin Integrated Management (PIM) is an ACAT 1C Acquisition Program. The program will replace the current fleet of M109 Family of Vehicles (FoV) consisting of the M109A6 Paladin Self Propelled Howitzer and M992A2 Field Artillery Ammunition Supply Vehicle (FAASV). PIM is an Army Modernization Program that addresses a critical capability gap created by the Non-Line of Sight Cannon termination in June of 2009 as well as obsolescence and Space, Weight, and Power (SWAP) issues in the M109 FoV current fleet. The PIM system integrates current Bradley Fighting Vehicle suspension and drive train items, Future Combat Systems (FCS) developed Electric Gun Drive systems and current fleet (M109A6) fire control systems into a new chassis providing better force protection, survivability, and increases in electrical power over the current fleet. PIM is a two vehicle system: The M109A7 Self Propelled Howitzer (SPH) and the M992A3 Carrier Ammunition, Tracked (CAT). The SPH has all characteristics listed above. The CAT utilizes all these same components and traits except those related directly to the cannon system. The PIM system replaces the current M109 FoV on a one for one basis, in the cannon fires battalions in the Armored Brigade Combat Team Formations and the Echelons above Brigade (EAB). The overall intent is to increase Soldier force protection, vehicle survivability, provide an appropriate amount of SWAP capacity to add future capabilities, increase vehicle reliability, reduce life cycle costs, and extend the life of the M109 FoV through FY 2050.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Paladin/FAASV Integrated Management (PIM) Development Description: Funding is provided for the following contractor developmental efforts: FY 2018 Plans: Funding enables the government to complete all efforts on the M109 FOV Program to include the close out of the existing EMD work effort. FY 2018 to FY 2019 Increase/Decrease Statement: There is no funding in FY19	28.908	1.755	-	-	-
Title: Test and Evaluation Description: Funding is provided for the following Government test efforts:	5.973	-	-	-	-
Title: Program Management Description: Funding is provided for the following program management support:	2.295	1.579	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0210609A / <i>Paladin Integrated Management (PIM)</i>	Project (Number/Name) ED8 / <i>Paladin Integrated Management (PIM)</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p><i>FY 2018 Plans:</i> Continue the Government System Engineering and Program Management for the total program including: Original Equipment Manufacturer (OEM) management consisting of weekly, monthly, and quarterly program management reviews; continue contract execution management for the EMD phase contract until completion of all efforts in FY 2018. Manage Government Developmental System Test and Evaluation program as it enters the LRIP testing phase. Management of the program cost, schedule, and performance metrics including making programmatic trade-off decisions. Management of Other Governmental Agencies (OGAs) that support the PIM program.</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> There is no funding in FY19</p>					
<p><i>Title:</i> Training</p> <p><i>Description:</i> Funding is provided for the following training government and contractor efforts:</p> <p><i>FY 2018 Plans:</i> Funding provides for the review of current training support packages, training aids and devices based on the EMD effort for cannon system development.</p> <p><i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> There is no funding in FY19</p>	2.726	2.778	-	-	-
Accomplishments/Planned Programs Subtotals	39.902	6.112	-	-	-

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• GZ0410: SSN: GZ0410000; <i>Paladin Integrated Management</i>	584.089	772.149	354.951	67.000	421.951	645.382	666.674	650.878	665.024	1,710.096	6,116.243
Remarks											

D. Acquisition Strategy
The PIM Program was initiated on 16 August 2007 under the BAE Systems, Inc., System Technical Support (STS) Contract W56HZV-07-C-0096. Subsequent work directives were awarded under BAE STS contract W56HZV-07-C-0256 to further define the configuration of the PIM vehicles. On 14 August 2009, a Research,

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0210609A / <i>Paladin Integrated Management (PIM)</i>	Project (Number/Name) ED8 / <i>Paladin Integrated Management (PIM)</i>
<p>Development, Test and Evaluation (RDT&E) Contract W56HZV-09-C-0550 was awarded to BAE Systems Inc. for the Prototype Development and Fabrication of 7 prototype vehicles (5 PIM Self Propelled Howitzer (SPH) Systems and 2 PIM Carrier Ammunition, Tracked (CAT) vehicles). A Comprehensive Contract Modification (CCM) award to the RDT&E contract was accomplished on 6 January 2012. This modification allows for the completion of the design engineering and initial developmental test portion of the Engineering and Manufacturing Development (EMD) Phase and transfers the system responsibility for the program from the Government to BAE Systems Inc. An additional modification to the EMD contract was awarded on 18 July 2014 to extend the contract until 31 March 2017 to cover contractor support to Production Qualification Testing (PQT), the Logistics Demonstration, and Initial Operational Test & Evaluation (IOT&E). The awarded Low-Rate Initial Production (LRIP) contract is of a Fixed Price Incentive Firm Target (FPIF) contract type for procurement of vehicles with a period of performance running from November 2013 through approximately June 2019. The LRIP contract will provide for three LRIP years with the initial base year including 19 SPHs and 18 CATs and the remaining three option years with 18 sets, 30 sets and 48 sets, respectively (each set consisting of one each SPH and CAT) of PIM vehicles. The Full Rate Production (FRP) contract is planned as a FPIF contract with the option to convert to a Firm Fixed Price (FFP) contract after the first year of FRP. The FRP contract provides for the remaining PIM vehicles to fulfill the requirement up to the Army Acquisition Objective of 580 sets.</p> <p>E. Performance Metrics N/A</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0210609A / <i>Paladin Integrated Management (PIM)</i>				ED8 / <i>Paladin Integrated Management (PIM)</i>							
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Data	SS/CPIF	BAE Systems : York, PA	1.515	-		-		-		-		-	0.000	1.515	-
Training	MIPR	Various OGAs : Various	7.675	2.726	Dec 2016	2.778		-		-		-	0.000	13.179	-
PIM Development-Government	MIPR	Various OGAs : Various	30.798	3.616	Dec 2016	1.755		-		-		-	0.000	36.169	-
PIM Development-Contractor	SS/CPIF	BAE Systems : York, PA	98.114	25.292	Dec 2016	-		-		-		-	0.000	123.406	-
Subtotal			138.102	31.634		4.533		-		-		-	0.000	174.269	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO/PEO Support	MIPR	PM/PEO Paladin/FAASV : Picatinny	16.840	2.295	Dec 2016	1.579		-		-		-	0.000	20.714	-
Subtotal			16.840	2.295		1.579		-		-		-	0.000	20.714	N/A
Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
System Level Testing	MIPR	Various OGAs : Various	58.621	5.973	Dec 2016	-		-		-		-	0.000	64.594	-
Subtotal			58.621	5.973		-		-		-		-	0.000	64.594	N/A
Project Cost Totals			213.563	39.902		6.112		-		-		-	0.000	259.577	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army							Date: February 2018			
Appropriation/Budget Activity 2040 / 5			R-1 Program Element (Number/Name) PE 0210609A / <i>Paladin Integrated Management (PIM)</i>			Project (Number/Name) ED8 / <i>Paladin Integrated Management (PIM)</i>				

	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
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Remarks									

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0210609A / <i>Paladin Integrated Management (PIM)</i>	Project (Number/Name) ED8 / <i>Paladin Integrated Management (PIM)</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Government Development Test	██████████				██████████																							
Low Rate Initial Production Deliveries	██████████				██████████																							
Full Up System Live Fire Test	██████████				██████████																							
IOTE 2	██████████				██████████																							
Full Rate Production Decision	██████████				██████████																							
TM Verification	██████████				██████████																							
FUE Net	██████████				██████████																							
Delta TM Verification	██████████				██████████																							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0210609A / <i>Paladin Integrated Management (PIM)</i>	Project (Number/Name) ED8 / <i>Paladin Integrated Management (PIM)</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Contractor Testing	4	2012	4	2015
Government Development Test	4	2012	3	2017
Low Rate Initial Production Contract	1	2014	2	2016
Low Rate Initial Production Deliveries	2	2015	4	2018
Full Up System Live Fire Test	3	2015	1	2017
IOTE 2	2	2018	2	2018
Full Rate Production Decision	4	2018	4	2018
TM Verification	2	2016	1	2017
FUE Net	1	2017	2	2017
Delta TM Verification	4	2017	4	2017

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0303032A / TROJAN - RH12
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	4.273	5.631	4.521	1.200	5.721	4.577	4.621	4.584	4.700	0.000	34.107
RH5: TROJAN - RH12 - MIP	-	4.273	5.631	4.521	1.200	5.721	4.577	4.621	4.584	4.700	0.000	34.107

A. Mission Description and Budget Item Justification

This project is a Military Intelligence Program (MIP). TROJAN research and development supports TROJAN Next Generation (TROJAN NexGEN), formerly TROJAN Classic XXI (TCXXI), future capabilities to fulfill the Army's need for worldwide, deployable, remobile, intelligence, surveillance and reconnaissance support that can dynamically execute operations from sanctuary-based to deployed assets in theater. In support of Army Modernization and Army Force Generation, TROJAN NexGEN will provide soldiers with a real-world, hands-on, live and near-real time Signals Intelligence (SIGINT) training environment sustaining, maintaining and enhancing their military occupational specialty proficiencies and specific target expertise. This operational readiness training will fulfill the Army's larger intelligence training requirement via a secure, collaborative architecture.

A key factor for future force success is the ability to collect, process, and use information about an adversary while preventing similar information from being disclosed. TROJAN NexGEN is a combined operational and readiness mission system which uses advanced networking technology to provide seamless rapid radio relay, secure communications to include voice, data, and electronic reconnaissance support to U.S. forces throughout the world. TROJAN NexGEN operations may be easily tailored to fit military intelligence unit training schedules and surged during specific events to involve every aspect of the tactical intelligence collection, processing, analysis and reporting systems. Engineers test and evaluate new digital intelligence collection, processing and dissemination technology using the fielded TROJAN NexGEN systems prior to the acquisition of those technologies. As part of the objective intelligence architecture, these capabilities will enable processing and dissemination of real-time intelligence data from various sources to form the intelligence needed to issue orders inside the threat decision cycle. To that end, it is imperative that TROJAN NexGEN keeps pace with digitization initiatives in order to respond aggressively to the emerging intelligence communication threat.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	4.273	5.631	4.521	-	4.521
Current President's Budget	4.273	5.631	4.521	1.200	5.721
Total Adjustments	0.000	0.000	0.000	1.200	1.200
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	0.000	1.200	1.200

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

Appropriation/Budget Activity
2040: *Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)*

R-1 Program Element (Number/Name)
PE 0303032A / TROJAN - RH12

Change Summary Explanation

FY 2019 OCO Funding increase of \$1.200 million is in support of Army requirement to Integrate and test specialized hardware/software.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0303032A / TROJAN - RH12				Project (Number/Name) RH5 / TROJAN - RH12 - MIP			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
RH5: TROJAN - RH12 - MIP	-	4.273	5.631	4.521	1.200	5.721	4.577	4.621	4.584	4.700	0.000	34.107
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project is a Military Intelligence Program (MIP). TROJAN research and development supports TROJAN Next Generation (TROJAN NexGEN), formerly TROJAN Classic XXI (TCXXI), future capabilities to fulfill the Army's need for worldwide, deployable, remobile, intelligence, surveillance and reconnaissance support that can dynamically execute operations from sanctuary-based to deployed assets in theater. In support of Army Modernization and Army Force Generation, TROJAN NexGEN will provide soldiers with a real-world, hands-on, live and near-real time SIGINT training environment sustaining, maintaining and enhancing their military occupational specialty proficiencies and specific target expertise. This operational readiness training will fulfill the Army's larger intelligence training requirement via a secure, collaborative architecture.

A key factor for future force success is the ability to collect, process, and use information about an adversary while preventing similar information from being disclosed. TROJAN NexGEN is a combined operational and readiness mission system which uses advanced networking technology to provide seamless rapid radio relay, secure communications to include voice, data, and electronic reconnaissance support to U.S. forces throughout the world. TROJAN NexGEN operations may be easily tailored to fit military intelligence unit training schedules and surged during specific events to involve every aspect of the tactical intelligence collection, processing, analysis and reporting systems. Engineers test and evaluate new digital intelligence collection, processing and dissemination technology using the fielded TROJAN NexGEN systems prior to the acquisition of those technologies. As part of the objective intelligence architecture, these capabilities will enable processing and dissemination of real-time intelligence data from various sources to form the intelligence needed to issue orders inside the threat decision cycle. To that end, it is imperative that TROJAN NexGEN keeps pace with digitization initiatives in order to respond aggressively to the emerging intelligence communication threat.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Integrate Direction Finding and geo-location	1.118	1.077	0.713	0.400	1.113
Description: Integrate Direction Finding (DF) and geolocation (GL) technologies into TROJAN Remote Receiving Groups.					
FY 2018 Plans: Continue efforts to integrate Direction Finding (DF) and geolocation technologies into TROJAN Remote Receiving Groups in accordance with Joint Interface Control Document (JICD) 4.2. Utilize field based risk reduction exercises to test and evaluate integrated technologies of the overall TROJAN Intelligence, Surveillance, and Reconnaissance (ISR) Enterprise.					
FY 2019 Base Plans:					

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303032A / TROJAN - RH12	Project (Number/Name) RH5 / TROJAN - RH12 - MIP
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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Will continue efforts to integrate Direction Finding (DF) and geolocation technologies into TROJAN Remote Receiving Groups in accordance with Joint Interface Control Document (JICD) 4.2. Will utilize field based risk reduction exercises to test and evaluate integrated technologies of the overall TROJAN Intelligence, Surveillance, and Reconnaissance (ISR) Enterprise.

FY 2019 OCO Plans:
TROJAN intends to support forward deployed JICD 4.2 capabilities to the Combatant Commands based on current threat. Funding allows the program to ensure the tactically-focused technology remains current and can adapt to Intelligence Community Information Technology Enterprise (IC-ITE) interoperability standards.

FY 2018 to FY 2019 Increase/Decrease Statement:
Overall decrease to FY19 (Base/OCO) in support of current Army strategy/senior leader priorities.

Title: Enable assured communications for the TROJAN Network architecture (formerly Improve security of the TROJAN Network architecture).	1.186	1.376	1.104	0.400	1.504
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Description: Acquire and apply multi-bandwidth compression algorithm technology to maximize TROJAN intelligence network throughput.

FY 2018 Plans:
Continue efforts to utilize Government off the shelf (GOTS) / Commercial of the shelf (COTS) solutions to secure data-at-rest / data-in-transit to extend the TROJAN intelligence network architecture to the edge.

FY 2019 Base Plans:
Will continue efforts to utilize Government off the shelf (GOTS) / Commercial of the shelf (COTS) solutions to secure data-at-rest / data-in-transit to extend the TROJAN intelligence network architecture to the edge.

FY 2019 OCO Plans:
Funds testing and evaluation in an operational theater, to include efforts to utilize Government off the shelf (GOTS) / Commercial of the shelf (COTS) solutions to secure data-at-rest / data-in-transit to extend the TROJAN intelligence network architecture to the edge.

FY 2018 to FY 2019 Increase/Decrease Statement:
Overall decrease to FY19 (Base/OCO) in support of current Army strategy/senior leader priorities.

Title: Integrate and test specialized hardware/software	0.505	1.750	1.405	0.400	1.805
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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303032A / TROJAN - RH12	Project (Number/Name) RH5 / TROJAN - RH12 - MIP
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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<p>Description: Integrate and test specialized hardware/software for classified pre-processing of new signals of interest utilizing enhanced signal processing algorithms. Resource development of GLAIVE software (SW). Integrated several new National Security Agency (NSA) SW packages.</p> <p>FY 2018 Plans: Continue integration and testing of specialized hardware/software for classified pre-processing of new signals of interest utilizing enhanced signal processing algorithms. Continue resource development of GLAIVE software. Continue efforts to develop TROJAN Intelligence Surveillance Reconnaissance enterprise. Continue efforts to integrate the REDHAWK architecture and JICD 4.2 across all platforms.</p> <p>FY 2019 Base Plans: Will continue integration and testing of specialized hardware/software for classified pre-processing of new signals of interest utilizing enhanced signal processing algorithms. Will continue resource development of GLAIVE software. Will continue efforts to develop TROJAN Intelligence Surveillance Reconnaissance enterprise. Will continue efforts to integrate the REDHAWK architecture and JICD 4.2 across all platforms.</p> <p>FY 2019 OCO Plans: Will support integration and testing of Intelligence Community Information Technology Enterprise (IC-ITE) during interoperability exercises such as Enterprise Challenge.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Overall decrease to FY19 (Base/OCO) in support of current Army strategy/senior leader priorities.</p>					
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<p>Title: Research and testing of receivers</p> <p>Description: Research and testing of receiver packages for fixed and transportable TROJAN systems to acquire non-standard modulations using Digital System Processing (DSP) and Software Defined Radio (SDR) technologies.</p> <p>FY 2018 Plans: Continue research and testing of receiver packages for fixed and transportable TROJAN systems to acquire non-standard modulations using DSP and SDRs.</p> <p>FY 2019 Base Plans: Will continue research and testing of receiver packages for fixed and transportable TROJAN systems to acquire non-standard modulations using DSP and SDRs.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement:</p>	0.295	0.255	0.524	-	0.524
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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303032A / TROJAN - RH12	Project (Number/Name) RH5 / TROJAN - RH12 - MIP
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
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Increase to FY19 in support of current Army strategy/senior leader priorities.

Title: Labor cost software (SW) engineers	0.775	0.775	0.775	-	0.775
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Description: Labor for two software (SW) engineers in support of GLAIVE and other above applicable efforts. Labor for one Material Developer (MAT DEV) technologist, one MAT DEV software and one MAT DEV Hardware (HW) engineer.

FY 2018 Plans:
Continue to resource labor for one MAT DEV technologist, two MAT DEV software engineers and two MAT DEV HW engineers.

FY 2019 Base Plans:
Will continue to resource labor for one MAT DEV technologist, two MAT DEV software engineers and two MAT DEV HW engineers.

Title: Development of Satellite Communication (SATCOM) dishes and transceivers	0.371	0.375	-	-	-
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Description: Development of smaller more mobile Satellite Communication (SATCOM) dishes and transceivers. Development of more efficient use of bandwidth, communications on the move and man-packable intelligence collection systems.

FY 2018 Plans:
Continue development of smaller tactical SATCOM dishes and transceivers to support beyond line of sight capabilities.

FY 2018 to FY 2019 Increase/Decrease Statement:
Decrease to FY19 in accordance with senior leader priorities.

Title: Develop specialized software enhancements to the TROJAN streaming subsystems	0.023	0.023	-	-	-
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Description: Develop specialized software enhancements to the TROJAN audio streaming subsystems to improve system redundancy and throughput capacity and system management capabilities; Investigate compression/processing technologies to reduce communications bandwidth requirements for remoted TROJAN systems, including streaming audio technologies.

FY 2018 Plans:

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303032A / TROJAN - RH12	Project (Number/Name) RH5 / TROJAN - RH12 - MIP
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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Continue efforts to develop specialized software enhancements to improve system redundancy and throughput capacity to enable support for full motion video (FMV) streaming.					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> Decrease to FY19 in accordance with senior leader priorities.					
Accomplishments/Planned Programs Subtotals	4.273	5.631	4.521	1.200	5.721

C. Other Program Funding Summary (\$ in Millions)											
<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• BA0326: TROJAN (MIP) (OPA SSN BA0326)	25.680	37.362	16.863	6.326	23.189	17.368	17.612	18.144	19.235	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Acquisition Strategy for the TROJAN NexGEN Systems supported by TROJAN RDT&E is to adapt and leverage from Commercial Off the Shelf (COTS) and Government Off the Shelf (GOTS) products. Additionally leverage off of development by DoD and other Government agencies to the greatest extent possible. TROJAN RDT&E is used to fund the development of enhancing these technologies to meet specific user requirements.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303032A / TROJAN - RH12	Project (Number/Name) RH5 / TROJAN - RH12 - MIP
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Labor Costs MAT DEV HW/SW Engineers	Various	CERDEC I2WD, APG, MD : MD	3.562	0.775	Oct 2016	0.775	Oct 2017	0.775	Oct 2018	-		0.775	0.000	5.887	-
Subtotal			3.562	0.775		0.775		0.775		-		0.775	0.000	5.887	N/A

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Integrate Direction Finding and geo-location	Various	APG : MD	2.900	1.118	Oct 2016	1.077		0.712	Oct 2018	0.400	Oct 2018	1.112	Continuing	Continuing	-
Improve security of the TROJAN Network architecture	Various	APG : MD	2.089	1.186	Oct 2016	1.376		1.105	Oct 2018	0.400	Oct 2018	1.505	Continuing	Continuing	-
Research and testing of Receivers	Various	APG : MD	1.346	0.295	Oct 2016	0.255		0.524	Oct 2018	-		0.524	Continuing	Continuing	-
Develop Satellite Communications (SATCOM) Dishes and transceivers	Various	APG : MD	2.898	0.371	Oct 2016	0.375		-		-		-	0.000	3.644	-
Specialized Software Enhancements	Various	APG : MD	0.952	0.023	Oct 2016	0.023		-		-		-	0.000	0.998	-
Develop Hardware/ Software Interface	Various	APG : MD	0.445	-		-		-		-		-	0.000	0.445	-
Subtotal			10.630	2.993		3.106		2.341		0.800		3.141	Continuing	Continuing	N/A

Test and Evaluation (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Integration and Testing of Hardware/Software	Various	APG : MD	3.082	0.505	Oct 2016	1.750		1.405	Oct 2018	0.400	Oct 2018	1.805	0.000	7.142	Continuing
Subtotal			3.082	0.505		1.750		1.405		0.400		1.805	0.000	7.142	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303032A / TROJAN - RH12	Project (Number/Name) RH5 / TROJAN - RH12 - MIP
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Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Hardware, Software and Systems Development	Development Efforts																											
Follow on Hardware, Software and Systems Development									Development Efforts																			

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303032A / TROJAN - RH12	Project (Number/Name) RH5 / TROJAN - RH12 - MIP
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Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Hardware, Software and Systems Development	1	2014	4	2018
Follow on Hardware, Software and Systems Development	1	2019	4	2021

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0303267A / <i>Auctioned Spectrum Relocation Fund</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	34.967	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	34.967
XR2: <i>Auctioned Spectrum Relocation Fund</i>	-	34.967	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	34.967

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L. 108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

B. Program Change Summary (\$ in Millions)

	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	34.967	0.000	0.000	-	0.000
Total Adjustments	34.967	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Mandatory Transfer Funding	34.967	-	-	-	-

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

Appropriation/Budget Activity 2040: Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0303367A / Spectrum Access Research and Development
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	66.125	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	66.125
FH7: Spectrum Usage Measurement System (SUMS)	-	7.200	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.200
FH8: DSA Rule Development and Validation	-	5.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.000
FH9: Flightline Radio network with Seamless Handoff	-	5.800	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.800
F11: Space-Time Coding - Aeronautical Mobile Telemetry	-	2.300	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.300
XR4: Military Full Duplex Communication (MFD-COMM)	-	10.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.000
XR5: SRW NB Relocation to VHF-UHF (DIST C)	-	1.022	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.022
XR6: Enhancing Coexistence for Army Force Protection	-	0.651	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.651
XR7: Conformal C-Band/ Multiband Antennas	-	0.982	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.982
XR9: Cellular-Based Range Telemetry (CRTM)	-	6.647	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.647
XS2: NexGen Spectrum Situational Awareness System FOUO	-	3.823	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.823
XS3: SLATE ATD Spectrum Cohabitation Demo	-	17.700	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.700
XS4: Training Spectrum Cohabitation Demonstration	-	5.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.000

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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 0303367A / <i>Spectrum Access Research and Development</i>
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A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L.108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	66.125	0.000	0.000	-	0.000
Total Adjustments	66.125	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Spectrum Funding	66.125	-	-	-	-

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0303367A / <i>Spectrum Access Research and Development</i>				Project (Number/Name) FH7 / <i>Spectrum Usage Measurement System (SUMS)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FH7: <i>Spectrum Usage Measurement System (SUMS)</i>	-	7.200	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	7.200
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L.108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0303367A / <i>Spectrum Access Research and Development</i>			Project (Number/Name) FH8 / <i>DSA Rule Development and Validation</i>				
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
<i>FH8: DSA Rule Development and Validation</i>	-	5.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L.108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0303367A / <i>Spectrum Access Research and Development</i>				Project (Number/Name) FH9 / <i>Flightline Radio network with Seamless Handoff</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
FH9: <i>Flightline Radio network with Seamless Handoff</i>	-	5.800	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.800
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L. 108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0303367A / <i>Spectrum Access Research and Development</i>				Project (Number/Name) F11 / <i>Space-Time Coding - Aeronautical Mobile Telemetry</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
F11: <i>Space-Time Coding - Aeronautical Mobile Telemetry</i>	-	2.300	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	2.300
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L. 108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0303367A / <i>Spectrum Access Research and Development</i>				Project (Number/Name) XR4 / <i>Military Full Duplex Communication (MFD-COMM)</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
XR4: <i>Military Full Duplex Communication (MFD-COMM)</i>	-	10.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	10.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L. 108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0303367A / <i>Spectrum Access Research and Development</i>			Project (Number/Name) XR5 / <i>SRW NB Relocation to VHF-UHF (DIST C)</i>				
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
XR5: <i>SRW NB Relocation to VHF-UHF (DIST C)</i>	-	1.022	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.022
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L. 108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303367A / <i>Spectrum Access Research and Development</i>	Project (Number/Name) XR6 / <i>Enhancing Coexistence for Army Force Protection</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
<i>XR6: Enhancing Coexistence for Army Force Protection</i>	-	0.651	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.651
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L. 108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303367A / <i>Spectrum Access Research and Development</i>	Project (Number/Name) XR7 / <i>Conformal C-Band/Multiband Antennas</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
<i>XR7: Conformal C-Band/Multiband Antennas</i>	-	0.982	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.982
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L. 108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303367A / <i>Spectrum Access Research and Development</i>	Project (Number/Name) XR9 / <i>Cellular-Based Range Telemetry (CRTM)</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
XR9: <i>Cellular-Based Range Telemetry (CRTM)</i>	-	6.647	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	6.647
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L. 108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0303367A / <i>Spectrum Access Research and Development</i>				Project (Number/Name) XS2 / <i>NexGen Spectrum Situational Awareness System FOUO</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
<i>XS2: NexGen Spectrum Situational Awareness System FOUO</i>	-	3.823	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	3.823
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L.108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303367A / <i>Spectrum Access Research and Development</i>	Project (Number/Name) XS3 / <i>SLATE ATD Spectrum Cohabitation Demo</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
XS3: <i>SLATE ATD Spectrum Cohabitation Demo</i>	-	17.700	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.700
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L. 108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303367A / <i>Spectrum Access Research and Development</i>	Project (Number/Name) XS4 / <i>Training Spectrum Cohabitation Demonstration</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
<i>XS4: Training Spectrum Cohabitation Demonstration</i>	-	5.000	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

In accordance with 47 USC 928 and the Commercial Spectrum Enhancement Act (CSEA) Title II, P.L. 108-494, dated December 23, 2004, established the Spectrum Relocation Fund (SRF) to provide Federal agencies a mechanism to recover the costs associated with relocating communication systems from spectrum bands which were auctioned for commercial purposes. The SRF is funded with proceeds from FCC conducted auctions of spectrum licenses. SRF funds have an indefinite obligation period and remain available until expended (X Year). The DoD Chief Information Officer (CIO) executes oversight of DoD spectrum relocation and sharing efforts.

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	18.425	14.616	8.922	-	8.922	16.142	35.424	54.951	14.187	0.000	162.667
EW5: <i>Electronic Warfare Development - MIP</i>	-	6.758	5.751	1.881	-	1.881	6.544	25.356	44.498	3.525	0.000	94.313
EW6: <i>ARAT-TSS - MIP</i>	-	11.667	8.865	7.041	-	7.041	9.598	10.068	10.453	10.662	0.000	68.354

A. Mission Description and Budget Item Justification

This Program Element encompasses engineering and manufacturing development for tactical Electronic Warfare (EW). EW encompasses the development of tactical EW equipment and systems mounted in both ground and air vehicles. The systems under this program provides the Army with the capability to degrade or deny hostile forces the effective use of their communications, counter mortar/counterbattery radars, surveillance radars, infrared/optical battlefield surveillance systems and electronically fused munitions. Existing Army EW systems must be replaced or upgraded to maintain their capability in the face of threats. Prophet Enhanced is the current system under the Prophet Ground acquisition program. Its primary mission is to provide 24-hour Situation Development and Information Superiority to the supported maneuver brigade to enable the most effective engagement of enemy forces. Prophet Enhanced provides a modular, scalable, open architecture-based system solution optimized for ease of use in a variety of configurations (Stationary-Fixed, Mobile and Manpack). The Army Reprogramming Analysis Team (ARAT) is a Department of the Army established project to develop techniques, methods, tools and architecture to reprogram mission software embedded in Army EW systems, Force Protection Systems (FPS), and Target Sensing Systems (TSS) in response to changes in threat signatures. ARAT Research and Development enables continuous development of: 1) automated threat analysis tools to rapidly detect (flag) threat changes within intelligence systems, 2) tools to minimize the time to develop EW Mission Software and Products (MSP) for both air and ground EW systems, 3) tools and technology to minimize the time required to test and validate MSPs, 4) improved communications conduits to transmit mission software changes to field users, and 5) enhanced mission-software uploading tools. These efforts allow for rapid threat analysis, simulation, mission software development, distribution and uploading of mission software changes directly to the supported Soldier in the field. The ARAT project will develop, test and equip an Army-wide infrastructure capable of rapidly reprogramming electronic combat software embedded in offensive and defensive weapon system.

Fiscal Year (FY) 2019 budget request funds Electronic Warfare (EW) Development for Prophet Enhanced efforts (Project EW5) and The Army Reprogramming Analysis Team (ARAT) efforts (Project EW6).

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Exhibit R-2, RDT&E Budget Item Justification: PB 2019 Army	Date: February 2018
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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 0304270A / <i>Electronic Warfare Development - MIP</i>
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B. Program Change Summary (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Previous President's Budget	18.425	14.616	12.885	-	12.885
Current President's Budget	18.425	14.616	8.922	-	8.922
Total Adjustments	0.000	0.000	-3.963	-	-3.963
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-3.963	-	-3.963

Change Summary Explanation

Funding decrease by \$3.963M due to economic adjustments.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army										Date: February 2018		
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>				Project (Number/Name) EW5 / <i>Electronic Warfare Development - MIP</i>			
COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EW5: <i>Electronic Warfare Development - MIP</i>	-	6.758	5.751	1.881	-	1.881	6.544	25.356	44.498	3.525	0.000	94.313
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Prophet Enhanced is the current system under the Prophet Ground acquisition program. Funds provide for development and integration of Technical Insertion upgrades for Next Generation Signals and state-of-the-art Signals Intelligence (SIGINT) exploitation techniques to increase the capabilities of the Prophet Enhanced and maintain operational relevance. The Prophet Enhanced is the tactical commander's sole organic ground-based SIGINT/Electronic Warfare system for the Multi-Function Teams (MfTs), Stryker Brigade Combat Teams (SBCTs), and Expeditionary-Military Intelligence Brigades (E-MIBs). Its primary mission is to provide 24-hour Situation Development and Information Superiority to the supported maneuver brigade to enable the most effective engagement of enemy forces. Prophet Enhanced provides a modular, scalable, open architecture-based system solution optimized for ease of use in a variety of configurations (Stationary-Fixed, Mobile and Manpack). It also incorporates product modification, integration, and test of equipment for rapid integration of Technical Insertions (TI) and product development to ensure operational relevance.

Justification:

Fiscal Year (FY) 2019 Base dollars in the amount of \$1.881 million will support continuing non-recurring engineering upgrades to the Prophet Enhanced Signals of Interest (SOI) baseline and implement Joint Interface Control Document (JICD) 4.2, enabling Theater Netcentric Geolocation (TNG) capabilities to leverage collaborative networks. Specifically, new signal capabilities will be developed, integrated, and tested/accredited to ensure that Prophet keeps pace with the constantly changing signal environment and to ensure that Prophet maintains its operational relevance against key enemy threats.

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Title: Improved Manpack Signal Set	6.258	-	-	-	-
Description: Development and integration of the improved Manpack enables the Prophet system to remain operationally relevant in the constantly changing signal environment.					
Title: Program Management	0.500	0.130	-	-	-
Description: Development of next generation signals, enhanced SIGINT exploitation, and improved manpack signal sets enable the Prophet system to remain operationally relevant with state-of-the-art Signal and Threat exploitation capabilities.					
FY 2018 Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>	Project (Number/Name) EW5 / <i>Electronic Warfare Development - MIP</i>

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Funds will provide for core, matrix and contractor system engineering and program management support for the Prophet program. FY 2018 to FY 2019 Increase/Decrease Statement: Funding allocation decreased due to FY2019 realignment of RDT&E funding to OMA for PMO costs.					
Title: Upgrade to JICD 4.2 Description: JCID 4.2 will allow Theater Netcentric Geolocation (TNG) capabilities to leverage collaborative networks. FY 2018 Plans: Development of new JICD 4.2 software and integration into Prophet Enhanced. FY 2019 Base Plans: Continuing development of new JICD 4.2 software and integration into Prophet Enhanced. FY 2018 to FY 2019 Increase/Decrease Statement: Majority of software development effort completed in FY2018, FY2019 allocation is less than FY2018 due to a lesser continuing integration effort to complete this task.	-	3.409	0.301	-	0.301
Title: Redhawk Signal of Interest upgrades Description: The Signal Environment that Prophet Systems exploit is constantly changing with evolving threats. This environment creates gaps in Prophet?s ability to collect and exploit these signals. Prophet must constantly integrate software upgrades to remain relevant against these numerous, key, and high-priority emerging threats. FY 2018 Plans: Development of Next Generation SIGINT capabilities to include numerous key REDHAWK software applications and integration of the Next Generation Manpack software into the Prophet SIGINT Software (PS2) Baseline. The REDHAWK applications and Manpack Software address signal exploitation gaps in Prophet?s ability to exploit key tactical signals and threats. FY 2019 Base Plans: Continuing development of Next Generation SIGINT capabilities to include numerous key REDHAWK software applications and integration of the Next Generation Manpack software into the Prophet SIGINT Software (PS2)	-	2.212	1.580	-	1.580

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>	Project (Number/Name) EW5 / <i>Electronic Warfare Development - MIP</i>
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B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
Baseline. The REDHAWK applications and Manpack Software address signal exploitation gaps in Prophet's ability to exploit key tactical signals and threats.					
<i>FY 2018 to FY 2019 Increase/Decrease Statement:</i> The majority of the Redhawk capability is developed in FY2018, the FY2019 allocation is less than FY2018 due to a lesser effort in FY2019 to fully integrate this single Redhawk capability.					
Accomplishments/Planned Programs Subtotals	6.758	5.751	1.881	-	1.881

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

<u>Line Item</u>	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• BZ9753: <i>Prophet Enhanced Modification MIP (BZ9753)</i>	46.350	49.093	41.836	2.011	43.847	40.444	11.549	-	68.188	Continuing	Continuing
• BZ9751: <i>Special Purpose Systems (MIP OPA) (Prophet Only) - BZ9751</i>	4.055	4.241	4.162	-	4.162	-	-	-	6.464	Continuing	Continuing
• DX9: <i>National Integration to Tactical Systems (MIP) - DX9 (TNG, PE 0605766A)</i>	4.955	2.820	9.060	-	9.060	8.090	5.723	6.683	5.925	Continuing	Continuing

Remarks

D. Acquisition Strategy

The Prophet Research and Development (R&D) Acquisition Strategy is structured to maintain operational relevancy of Prophet Enhanced systems in a dynamic threat environment while reducing risk and streamlining business and engineering processes. Contracting activities are to modify forty-seven previously fielded ground tactical SIGINT systems to the current technology baseline. The Technical Insertion (TI) contract supports R&D and other developmental work.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army												Date: February 2018			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
2040 / 5				PE 0304270A / <i>Electronic Warfare Development - MIP</i>				EW5 / <i>Electronic Warfare Development - MIP</i>							
Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	PM Electronic Warfare & Cyber : APG, MD	0.981	0.500	Nov 2016	0.130		-		-		-	Continuing	Continuing	Continuing
Subtotal			0.981	0.500		0.130		-		-		-	Continuing	Continuing	N/A
Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Software SIL	C/CPFF	GD C4 Systems : Scottsdale, AZ	0.889	-		-		-		-		-	0.000	0.889	-
Improved Manpack Signal Set	C/CPFF	TBD : TBD	-	5.258	Dec 2016	-		-		-		-	0.000	5.258	-
Upgrade to JICD 4.2	SS/CPFF	GD Mission Systems : Scottsdale, AZ	-	-		3.409	Jan 2018	0.899	Jan 2019	-		0.899	Continuing	Continuing	Continuing
Redhawk Signals of Interest Upgrade	SS/CPFF	GD Mission Systems : Scottsdale, AZ	-	-		2.212	Jan 2018	0.982	Jan 2019	-		0.982	Continuing	Continuing	Continuing
Subtotal			0.889	5.258		5.621		1.881		-		1.881	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering & Software Support	C/DIQ	AASKI Technology : APG, MD	0.964	-		-		-		-		-	0.000	0.964	-
System Integration Lab	Various	I2WD : APG, MD	2.500	-		-		-		-		-	0.000	2.500	-
Subtotal			3.464	-		-		-		-		-	0.000	3.464	N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>	Project (Number/Name) EW5 / <i>Electronic Warfare Development - MIP</i>

Test and Evaluation (\$ in Millions)			FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
Prepare and Conduct Delta Testing	MIPR	EPG/AEC : Huachuca, AZ	1.240	-		-		-		-		-	Continuing	Continuing	Continuing
Software Qualification Test	MIPR	TBD : TBD	-	1.000	Jul 2017	-		-		-		-	0.000	1.000	-
Subtotal			1.240	1.000		-		-		-		-	Continuing	Continuing	N/A
Project Cost Totals			6.574	6.758		5.751		1.881		-		1.881	Continuing	Continuing	N/A

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>	Project (Number/Name) EW5 / <i>Electronic Warfare Development - MIP</i>

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Production - Prophet Enhanced	[Redacted]				[Redacted]																							
Fielding - Prophet Enhanced	[Redacted]				[Redacted]																							
Prophet Technical Insertion (TI)	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Technical Test (TT)	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Contract Award - Modification of Legacy Systems	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Prophet Modification of Legacy Systems	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							
Prophet Modification of Legacy Systems - Fielding	[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]				[Redacted]							

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>	Project (Number/Name) EW5 / <i>Electronic Warfare Development - MIP</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Production - Prophet Enhanced	2	2009	1	2017
Fielding - Prophet Enhanced	2	2010	1	2018
Prophet Technical Insertion (TI)	4	2008	4	2021
Technical Test (TT)	1	2018	2	2018
Contract Award - Modification of Legacy Systems	3	2017	3	2017
Prophet Modification of Legacy Systems	3	2017	4	2021
Prophet Modification of Legacy Systems - Fielding	2	2018	4	2022

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

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>	Project (Number/Name) EW6 / ARAT-TSS - MIP
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
EW6: ARAT-TSS - MIP	-	11.667	8.865	7.041	-	7.041	9.598	10.068	10.453	10.662	0.000	68.354
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The Army Reprogramming Analysis Team (ARAT) is a Department of the Army established program to develop techniques, methods, tools and architecture to rapidly reprogram mission software embedded in Army Electronic Warfare (EW) systems in response to changes in threat signatures. The regulatory guidance directing this mission is contained in Army Regulation (AR) 525-15, AR 525-22, and AR 95-1. The ARAT develops integrated technical solutions required to counter increasingly sophisticated EW threats to US Forces. The ARAT reprogramming infrastructure supports the Army Campaign Plan to provide the Regionally Aligned Forces tactical Commander timely rapid-reprogramming capability of EW systems with mission software. The ARAT mission responsibility is to develop and distribute Mission Software and Products to forward deployed combat forces. ARAT identifies and analyzes threat signature changes which affect EW systems; determine the impact of observed signature changes; rapidly develop new mission software to adapt friendly systems to detect and defeat enemy threats to U.S. Army ground and air platforms; disseminate the Mission Software and Products to forward deployed forces, and provide government developed tools and software to upload new mission software into the affected EW systems.

A. Mission Description and Budget Item Justification

Current military operations are conducted in a rapidly changing threat environment, where Improvised Explosive Devices (IEDs), Infra Red (IR) man-portable air defense systems (MANPADS) seekers, radar guided surface-to-air-missiles (SAM), laser guided weapons, anti-helicopter mines, and targeting sensors are proliferating and evolving. Integrated solutions are required to counter increasingly sophisticated EW threats. The ARAT reprogramming infrastructure supports the tactical Commander by providing timely rapid reprogramming of mission software and information dissemination for Army supported, Joint and allied services. ARAT supports integrated reprogramming of target acquisition, target engagement, vehicle survivability, and Aircraft Survivability Equipment (ASE). ARAT rapid-reprogramming infrastructure supports tactical requirements for deployed aircraft and ground-based (e.g. Counter Radio-Controlled Improvised Explosive Device (CREW)) survivability systems. ARAT identifies and analyzes threat signature changes which affect EW systems; determines the impact of observed signature changes; develops new mission software to adapt the system to the changes; disseminates the mission software; and provides methods to upload the new mission software into the affected EW systems. Each element within the ARAT infrastructure plays a specific role within the program's rapid reprogramming process, providing the Soldier with the capability to install mission and target identification software at the lowest possible level, thus maximizing flexibility for tactical commanders. ARAT participates in the operational and developmental test design of Army EW systems, and supports Joint Service Reprogramming Exercises in all theaters. ARAT Research and Development enables continuous development of: 1) automated threat analysis tools to rapidly detect (flag) threat changes within the intelligence system, 2) tools to minimize the time to develop Mission Software and Products (MSP), 3) tools and technology to minimize the time required to test and validate MSPs, 4) improved communications conduits to rapidly transmit mission software to upload into supported EW systems. These efforts allow for rapid threat analysis, threat modeling and simulation, mission software development and testing, distribution and uploading of mission software directly to the supported Soldier in the field.

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>	Project (Number/Name) EW6 / ARAT-TSS - MIP

B. Accomplishments/Planned Programs (\$ in Millions)	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Title: Keeping Pace with the Enemy and Technology</p> <p>Description: This effort focuses on developing a capability for the Government to rapidly develop and distribute organic mission software solutions for multiple EW systems. The Army must continually modernize and enhance software tools and processes counter enemy technology. ARAT EW6 Military Intelligence Program (MIP) executes Research, Development, Test, and Evaluation (RDTE) funding to provide an organic Army capability for this organization to rapidly develop and distribute mission software solutions for forward deployed combat forces.</p> <p>FY 2018 Plans: This FY effort will capitalize on accomplishments in FY17 and will continue to enhance: 1) Intelligence data requirements to support MSP development for Electro-Optical (EO)/Ultraviolet (UV)/Infrared (IR) spectrums and other multi-spectral sensors for aviation and non-aviation EW systems, 2) Government organic knowledge and application-base enabling reprogramming of future systems, 3) United States Government (USG) capability for the reprogramming of multi-spectral EW systems.</p> <p>FY 2019 Base Plans: This FY effort will capitalize on accomplishments in FY18 and will continue to enhance: 1) Intelligence data requirements to support MSP development for EO/UV/IR spectrums and other multi-spectral sensors for aviation and non-aviation EW systems, 2) Government organic knowledge and application-base enabling reprogramming of future systems, 3)USG capability for the reprogramming of multi-spectral EW systems.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Similar level of effort in FY18 and FY19.</p>	5.826	4.872	3.722	-	3.722
<p>Title: Infrastructure Improvements Multispectral</p> <p>Description: This effort focuses on enhancing the Army's multispectral Missile Warning System (MWS) software sustainment infrastructure. With the worldwide proliferation of MANPADS the Army must have the capability to rapidly analyze and develop mission software solutions to detect and counter MANPADS to defend Army Aviation platforms against this lethal threat.</p> <p>FY 2018 Plans: Will continue to conduct infrastructure enhancements for an OFP software development environment to enable the USG to develop and deploy an OFP environment for MWS. Continue evaluation of data and conduct analysis requirements for MANPADS characterization and enhance the organic government analysis and</p>	2.428	1.637	1.104	-	1.104

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army			Date: February 2018		
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>	Project (Number/Name) EW6 / ARAT-TSS - MIP			
B. Accomplishments/Planned Programs (\$ in Millions)					
sustainment process to support OFPs and subsequently adapt MWSs to new threats. Enhance government organic capability, thereby decreasing the risk that systems cannot be readily adapted to changing threats.					
FY 2019 Base Plans: Will continue to conduct infrastructure enhancements for an OFP software development environment to enable the USG to develop and deploy an OFP environment for MWS. Continue evaluation of data and conduct analysis requirements for MANPADS characterization and enhance the organic government analysis and sustainment process to support OFPs and subsequently adapt MWSs to new threats. Enhance government organic capability, thereby decreasing the risk that systems cannot be readily adapted to changing threats.					
FY 2018 to FY 2019 Increase/Decrease Statement: Similar level of effort in FY18 and FY19.					
Title: Infrastructure Improvement Radio Frequency General					
Description: This effort focuses on enhancing the Army's Radio Frequency (RF) EW system MSP development and distribution infrastructure. The Army must fight in a contested and congested EW environment. Mission software solutions to defend against RF threats must be rapidly developed, tested and distributed to Soldiers on an ever changing battlefield.					
FY 2018 Plans: Will further augment the ARAT communications architecture to enhance the rapid secure transmission of mission software changes to EW systems, with emphasis on remote user and highly mobile Soldier connectivity. Will continue to enhance the USG integrated EW development and test environment to ensure MSP and threat countermeasure integration on the respective EW platform.					
FY 2019 Base Plans: Will further augment the ARAT communications architecture to enhance the rapid secure transmission of mission software changes to EW systems, with emphasis on remote user and highly mobile Soldier connectivity. Will continue to enhance the USG integrated EW development and test environment to ensure MSP and threat countermeasure integration on the respective EW platform.					
FY 2018 to FY 2019 Increase/Decrease Statement: Similar level of effort in FY18 and FY19.					
Title: Threat Flagging and Mission Data Set Reprogramming Tool Development					
	2.491	1.538	1.349	-	1.349
	0.922	0.818	0.866	-	0.866

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>	Project (Number/Name) EW6 / ARAT-TSS - MIP

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

	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total
<p>Description: This effort focuses on enhancing the Army's capability to monitor changes in enemy EW systems that affect system performance of onboard Army detection, declaration and countermeasure EW systems. The enemy is continuously developing or modifying it's EW systems. For Army platforms to have protection against enemy systems it must have a robust capability to immediately detect changes in threat system performance and rapidly develop, test, and distribute a mission software solution that counter the threat. This effort will enhance the Army's capability bridge detection of a change in enemy threat and the rapid development of MSP.</p> <p>FY 2018 Plans: Will continue to enhance spiral applications for ARAT internal system specific threat flagging, threat analysis, mission software generation and testing processes. Will conduct spiral enhancement of threat flagging (threat performance change detection) and intelligence analytical tools, based on supported systems performance criteria, to rapidly identify and counter emerging and changing threats that adversely affect the performance of the EW systems. Will continue to enhance mission software development, testing and validation tools to decrease time from threat-change detection to the distribution of MSP in order to increase the accuracy and fidelity of threat identification, and reduce the engineering involvement/workload associated with the manually intensive analysis and MSP development processes. Will continue to enhance software tools that enhance a data support infrastructure that employs the EWIR database.</p> <p>FY 2019 Base Plans: Will continue to enhance spiral applications for ARAT internal system specific threat flagging, threat analysis, mission software generation and testing processes. Will conduct spiral enhancement of threat flagging (threat performance change detection) and intelligence analytical tools, based on supported systems performance criteria, to rapidly identify and counter emerging and changing threats that adversely affect the performance of the EW systems. Will continue to enhance mission software development, testing and validation tools to decrease time from threat-change detection to the distribution of MSP in order to increase the accuracy and fidelity of threat identification, and reduce the engineering involvement/workload associated with the manually intensive analysis and MSP development processes. Will continue to enhance software tools that enhance a data support infrastructure that employs the EWIR database.</p> <p>FY 2018 to FY 2019 Increase/Decrease Statement: Similar level of effort in FY18 and FY19.</p>					
Accomplishments/Planned Programs Subtotals	11.667	8.865	7.041	-	7.041

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Exhibit R-2A, RDT&E Project Justification: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>	Project (Number/Name) EW6 / <i>ARAT-TSS - MIP</i>

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

Remarks

D. Acquisition Strategy

The efforts to be funded in this project will require a combination of systems specific and high-tech knowledge. The contractual services portion for the project will be obtained from both the Communications-Electronics Command (CECOM) Software Engineering Center (SEC) competitive omnibus and the Research, Development and Engineering Command (RDECOM) and the Defense Technical Intelligence Center (DTIC) high tech contracts.

E. Performance Metrics

N/A

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2019 Army **Date:** February 2018

Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>	Project (Number/Name) EW6 / <i>ARAT-TSS - MIP</i>
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Management Services (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management	Various	CECOM SEC : Aberdeen Proving Ground, MD	0.256	0.266		8.865		7.041		-		7.041	Continuing	Continuing	Continuing
Subtotal			0.256	0.266		8.865		7.041		-		7.041	Continuing	Continuing	N/A

Remarks
Beginning FY16, Program Management cost is properly aligned in Management Services.

Product Development (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 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			
USG Labor	Various	CECOM SEC : Various Locations	3.111	-		-		-		-		-	0.000	3.111	-
Travel	Various	CECOM SEC : Various Locations	0.838	-		-		-		-		-	0.000	0.838	-
Subtotal			3.949	-		-		-		-		-	0.000	3.949	N/A

Support (\$ in Millions)				FY 2017		FY 2018		FY 2019 Base		FY 2019 OCO		FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Development Support	Various	CECOM SEC, RDECOM, DTIC : Various Locations	23.325	11.401		-		-		-		-	Continuing	Continuing	Continuing
Subtotal			23.325	11.401		-		-		-		-	Continuing	Continuing	N/A

			Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			27.530	11.667	8.865	7.041	-	7.041	Continuing	Continuing	N/A

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Exhibit R-4, RDT&E Schedule Profile: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>	Project (Number/Name) EW6 / ARAT-TSS - MIP

Event Name	FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Software Development Support (see notes in Schedule Detail)	[REDACTED]																											
	[REDACTED]																											

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Exhibit R-4A, RDT&E Schedule Details: PB 2019 Army		Date: February 2018
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / <i>Electronic Warfare Development - MIP</i>	Project (Number/Name) EW6 / <i>ARAT-TSS - MIP</i>

Schedule Details

Events	Start		End	
	Quarter	Year	Quarter	Year
Software Development Support (see notes in Schedule Detail)	1	2015	4	2021

- Note**
- Software Test Automation
 - Threat Analysis Data Evaluation Tool
 - Enhance Data Distribution

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

Appropriation/Budget Activity 2040: <i>Research, Development, Test & Evaluation, Army / BA 5: System Development & Demonstration (SDD)</i>	R-1 Program Element (Number/Name) PE 1205117A / <i>Tractor Bears</i>
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COST (\$ in Millions)	Prior Years	FY 2017	FY 2018	FY 2019 Base	FY 2019 OCO	FY 2019 Total	FY 2020	FY 2021	FY 2022	FY 2023	Cost To Complete	Total Cost
Total Program Element	-	0.000	17.928	23.170	-	23.170	54.551	42.716	13.848	13.248	0.000	165.461
FG3: <i>Tractor Bears</i>	-	0.000	17.928	23.170	-	23.170	54.551	42.716	13.848	13.248	0.000	165.461

A. Mission Description and Budget Item Justification

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

B. Program Change Summary (\$ in Millions)

	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019 Base</u>	<u>FY 2019 OCO</u>	<u>FY 2019 Total</u>
Previous President's Budget	0.000	17.928	30.961	-	30.961
Current President's Budget	0.000	17.928	23.170	-	23.170
Total Adjustments	0.000	0.000	-7.791	-	-7.791
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-7.791	-	-7.791

Change Summary Explanation

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