Department of Defense
Fiscal Year (FY) 2020 Budget Estimates

March 2019

Army

Justification Book of

Research, Development, Test & Evaluation, Army

RDT&E − Volume III, Budget Activity 5C

Table of Contents

UNCLASSIFIED
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, $12,396,895,000.00 to remain available for obligation until September 30, 2021.

OCO for Direct War Costs ($182,624,000.00): Direct War costs are those combat or direct combat support costs that will not continue to be expended once combat operations end at major contingency locations.

OCO for Enduring Requirements ($21,500,000.00): OCO for Enduring Requirements are enduring in-theater and in-CONUS costs that will likely remain after combat operations cease, and have previously been funded in OCO.

COST STATEMENT

The following Justification Books were prepared at a cost of $366,803: Aircraft (ACFT), Missiles (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.

FY 2020 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 2020.

2. Relationship of the FY 2020 Budget Submitted to Congress to the FY 2019 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.

New Start Programs:

Budget Activity	***OSDPE / Project***	***Project Title***
02	0602145A / BJ9	Autonomous Mobility Tech
02	0602145A / BK2	Virtual Prototyping Technology
02	0602145A / BK3	Next Gen Intelligent Fire Control (NG-IFC) Tech
02	0602145A / BK5	Adv Direct In-Direct Armament Sys (ADIDAS) Tech
03	0603002A / MM7	Enabling Med Cap to Support Dispersed OPS Adv Tech
04	0603619A / BU5	Standoff Volcano Obstacle (SAVO) Adv Tech
04	0603639A / EU3	.50 Caliber All-Purpose Tactical Cartridge (APTC)
04	0603774A / VT8	SOLDIER PRECISION TARGETING DEVICES - ADV DEV
04	0603827A / CF2	Integrated Soldier Systems Prototyping (SL CFT)
04	0604021A / AW7	Electronic Warfare Technology Maturation (MIP)
04	0604115A / AX8	Adv Leth and Accuracy Sys for Med Calber (ALAS-MC)
04	0604115A / AX9	Adv Mobility Experimental Prototype Adv Tech
04	0604115A / AY1	MUM-T Platform Enabler
04	0604115A / AY2	Army Operational Fires
04	0604115A / AY3	Strategic Long Range Cannon
04	0604182A / HX1	Land-Based Hypersonic Missile

04	0604403A / FM3	Future Interceptor
04	0604541A / BT1	Interoperability
04	0604541A / BT2	Command Post Mobility/Survivability
04	0604541A / BT3	Common Operating Environment (COE)
04	0604541A / BT4	Network Technology Maturation Initiatives (NTMI)
04	0604541A / BT5	Integrated Tactical Network/Enterprise Network
04	0604644A / MR1	Mobile Medium Range Missile
05	0604601A / CF3	Integrated Soldier Systems (SL CFT)
05	0604802A / EP2	Shoulder-Launched Munitions
05	0604827A / FK4	Soldier Borne Sensor (SBS)
05	0604854A / HB6	Mobile Howitzer
05	0605041A / CY5	CYBER Situational Understanding
05	0605625A / CF6	Next Generation Combat Vehicle (NGCV)
07	0205778A / EG2	GMLRS Alternative Warheads
07	0607145A / FD5	Apache Product Improvement
07	1203142A / FI8	Protected Anti-JAM Tactical SATCOM

Program Element/Project Restructures:

Budget Activity	***Old OSDPE / Project: Title***	***New OSDPE / Project***
01	0601101A / 91A: ILIR-AMC	0601102A / AA1
01	0601101A / F16: ILIR-SMDC	0601102A / AA2
01	0601102A / 305: ATR Research	0601102A / AA9
01	0601102A / 31B: Infrared Optics Rsch	0601102A / AA8
01	0601102A / 52C: Mapping & Remote Sens	0601102A / AB2
01	0601102A / 53A: Battlefield Env & Sig	0601102A / AA7
01	0601102A / 74A: Human Engineering	0601102A / AA4
01	0601102A / 74F: Pers Perf & Training	0601102A / AA4

01	0601102A / ET6: BASIC RESCH IN CLINICAL & REHABILITATIVE MED	0601102A / AB1
01	0601102A / F20: Adv Propulsion Rsch	0601102A / AA6
01	0601102A / F22: Rsch In Veh Mobility	0601102A / AA6
01	0601102A / H42: Materials & Mechanics	0601102A / AA7
01	0601102A / H43: Research In Ballistics	0601102A / AA7
01	0601102A / H44: Adv Sensors Research	0601102A / AA5, AA7, & AA8
01	0601102A / H45: Air Mobility	0601102A / AA6
01	0601102A / H47: Applied Physics Rsch	0601102A / AA9
01	0601102A / H48: Battlespace Info & Comm Rsc	0601102A / AA9
01	0601102A / H52: Equip For The Soldier	0601102A / AA8
01	0601102A / H57: Single Investigator Basic Research	0601102A / AA3
01	0601102A / H66: Adv Structures Rsch	0601102A / AA6
01	0601102A / H67: Environmental Research	0601102A / AA7
01	0601102A / S13: Sci BS/Med Rsh Inf Dis	0601102A / AB1
01	0601102A / S14: Sci BS/Cbt Cas Care Rs	0601102A / AB1
01	0601102A / S15: Sci BS/Army Op Med Rsh	0601102A / AB1
01	0601102A / T22: Soil & Rock Mech	0601102A / AB2
01	0601102A / T23: Basic Res Mil Const	0601102A / AB2
01	0601102A / T24: Signature Physics And Terrain State Basic Research	0601102A / AB2
01	0601102A / T25: Environmental Science Basic Research	0601102A / AB2
01	0601102A / T63: Robotics Autonomy, Manipulation, & Portability Rsh	0601102A / AA6
01	0601102A / T64: Sci BS/System Biology And Network Science	0601102A / AB1
01	0601102A / VR9: Surface Science Research	0601102A / AA7
01	0601103A / D55: University Research Initiative	0601103A / AB3
01	0601104A / EA6: Cyber Collaborative Research Alliance	0601104A / AB7
01	0601104A / F17: Neuroergonomics Collaborative Technology Alliance	0601104A / AB7
01	0601104A / FF5: Distributed Collaborative Intelligent Systems CTA	0601104A / AB7
01	0601104A / FF7: Internet of Battlefield Things CTA	0601104A / AB7
01	0601104A / H04: HBCU/MI Programs	0601104A / AB4

01	0601104A / H05: Institute For Collaborative Biotechnologies	0601104A / AB7 & AB4
01	0601104A / H59: International Tech Centers	0601104A / AC6
01	0601104A / H73: Automotive Research Center (ARC)	0601104A / AB4
01	0601104A / J08: Institute For Creative Technologies (ICT)	0601104A / AB4
01	0601104A / J12: Institute For Soldier Nanotechnology (ISN)	0601104A / AB4
01	0601104A / J14: Army Educational Outreach Program	0601104A / AB8
01	0601104A / J15: Network Sciences ITA	0601104A / AB7
01	0601104A / J17: Vertical Lift Research Center Of Excellence	0601104A / AB4
01	0601104A / VS2: Multi-Scale Materials Modeling Centers	0601104A / AB7
01	0601104A / VS3: Center For Quantum Science Research	0601104A / AB7
02	0602105A / H84: Materials	0602141A / AH8, 0602143A / AZ5 & BE6, 0602145A / BI4
02	0602105A / XW4: Manufacturing Science	0602144A / BL1
02	0602120A / H16: S3I Technology	0602145A / BI2, 0602146A / AP5 & AR1, 0602148A / AL8, 0602150A / AD5
02	0602120A / TS1: Tactical Space Research	0602146A / AO5
02	0602120A / TS2: Robotics Technology	0602145A / BF8
02	0602211A / 47A: AERON & ACFT Wpns Tech	0602148A / AJ6, AJ4, AJ8, AM2, AI7, AK2, AL2, AI5, AJ2, AK1
02	0602211A / 47B: Veh Prop & Struct Tech	0602148A / AK9, AL5, AI9, AL4
02	0602270A / 906: Tactical Electronic Warfare Applied Research	0602146A / AN7, AO2, 0602148A / AK2
02	0602270A / CYB: Applied Offensive Cyber	0602146A / AQ3
02	0602303A / 214: Missile Technology	0602147A / AF8, AF3, AG2, AE7, AG1, AG9, AF9, AF5, AH2, AF6, AF7, 0602148A / AK4, 0602150A / AD3, AD7
02	0602307A / 042: High Energy Laser Technology	0602150A / AC9
02	0602308A / C90: Advanced Distributed Simulation	0602143A / BC3, BE8, 0602145A / BF6
02	0602308A / D02: Modeling & Simulation For Training And Design	0602143A / BE8
02	0602601A / C05: Armor Applied Research	0602145A / BG6, BH9
02	0602601A / H77: National Automotive Center	0602145A / BJ3, BI9
02	0602601A / H91: Ground Vehicle Technology	0602145A / BF1, BF3, BF6, BH7, BH5
02	0602618A / H80: Survivability And Lethality Technology	0602141A / AH5, AH6, AH7, 0602143A / AY6, 0602145A / BG6, 0602147A / AH4
02	0602622A / 552: Smoke/Novel Effect Mun	0602144A / BL2, 0602145A / BG8

02	0602623A / H21: Jt Svc Sa Prog (JSSAP)	0602143A / AY6
02	0602624A / H18: Weapons & Munitions Technologies	0602147A / AG6, AG4, BN4, 0602148A / AK6
02	0602624A / H28: Warheads/Energetics Technologies	0602145A / AH9, 0602147A / AG8, AG6, 0602148A / AK2
02	0602705A / EM8: High Power And Energy Component Technology	0602145A / BH7, 0602146A / AP4, AO2, 0602150A / AD2
02	0602705A / H11: Tactical And Component Power Technology	0602143A / BD8, 0602148A / AM4
02	0602705A / H94: Elec & Electronic Dev	0602144A / BL1, 0602146A / AV9, AO4, AV5, 0602148A / AK2
02	0602709A / H95: Night Vision And Electro-Optic Technology	0602143A / BD1, 0602145A / BH2, BF9, BJ2, 0602148A / AK2
02	0602712A / H24: Countermine Tech	0602143A / BD1, 0602144A / BL4, 0602145A / BJ7
02	0602712A / H35: Camouflage & Counter-Recon Tech	0602145A / BI2
02	0602716A / H70: Human Fact Eng Sys Dev	0602143A / AY6, BB7, BC3, BE8, 0602145A / BF6
02	0602720A / 048: Ind Oper Poll Ctrl Tec	0602144A / BK7
02	0602720A / 835: Mil Med Environ Crit	0602146A / AR5
02	0602720A / 896: Base Fac Environ Qual	0602146A / AR5
02	0602782A / 779: Command, Control And Platform Electronics Tech	0602146A / AV6, AW1, AQ9, AW3, AW5
02	0602782A / CY2: Applied Defensive Cyber	0602146A / AP1, AO8
02	0602782A / H92: Communications Technology	0602143A / AN1, 0602146A / AP7, AM6, AN3, AM8, AN5, AO2, AN9
02	0602783A / Y10: Computer/Info Sci Tech	0602146A / AP3
02	0602784A / 855: Topographical, Image Intel & Space	0602146A / AU5, AU3, AT7, AT9
02	0602784A / H71: Meteorological Research For Battle Command	0602146A / AV7
02	0602784A / T40: Mob/Wpns Eff Tech	0602144A / BL7, BL9, 0602145A / BF1, BG2, 0602146A / AR9, AT2, 0602150A / AE2
02	0602784A / T41: Mil Facilities Eng Tec	0602144A / BK7
02	0602784A / T42: Terrestrial Science Applied Research	0602146A / AT7
02	0602784A / T45: Energy Tec Apl Mil Fac	0602144A / BK7
02	0602786A / H98: Clothing & Equipm Tech	0602143A / AZ2, AZ9, BB4, BB5, BB9, BC2, BC6, BD6
02	0602786A / H99: Joint Service Combat Feeding Technology	0602143A / BE3
02	0602786A / XW5: Small Unit Expeditionary Maneuver Technology	0602143A / BE1, BE3, BR9
02	0602787A / 869: Warfighter Health Prot & Perf Stnds	0602787A / MK4
02	0602787A / 870: Dod Med Def Ag Inf Dis	0602787A / MM8
02	0602787A / 874: Cbt Casualty Care Tech	0602787A / MM4

02	0602787A / ET4: Appl Resch in Clinical and Rehabilitative Medicine	0602787A / MN1
02	0602787A / XV5: Medical Capabilities to Support Dispersed Ops	0602787A / MM6
03	0603001A / 242: Airdrop Equipment	0603118A / BE5
03	0603001A / C07: Joint Service Combat Feeding Tech Demo	0603118A / BE2
03	0603001A / FF6: Individual Protection	0603118A / AY9, AZ6, AZ8, BB3
03	0603001A / J50: Future Warrior Technology Integration	0603118A / BB6, BC1, BC4, BD7, BD9, BB8
03	0603001A / XW6: Small Unit Expeditionary Maneuver	0603118A / BE5
03	0603002A / 810: Ind Base Id Vacc&Drug	0603002A / MN8, MM9, MO9
03	0603002A / 840: Combat Injury Mgmt	0603002A / MO4, MN3, MO7, MN5, MM5, MO2
03	0603002A / MM3: Warfighter Medical Protection & Performance	0603002A / MN6, MO8, MN9, MO3, MN7, MG4
03	0603003A / 313: Adv Rotarywing Veh Tech	0603465A / AI4, AI6, AJ3, AJ5, AJ9, AK3, AK8, AL6 AL9, & AM3
03	0603003A / 436: Rotarywing MEP Integ	0603465A / AL1
03	0603003A / 447: ACFT Demo Engines	0603465A / AI8 & AJ1
03	0603004A / 232: Advanced Lethality & Survivability Demo	0603118A / AY7, 0603462A / BF5, BG5, BI1, BK4, BK6, 0603464A / AE6, AG3, AG5, AG7, 0603465A / AK7
03	0603004A / L96: High Energy Laser Technology Demo	0603466A / AD1
03	0603004A / L97: Smoke And Obscurants Advanced Technology	0603119A / BL3, 0603462A / BG7, BG9
03	0603005A / 221: Combat Veh Survivablty	0603462A / BG7, BH1, BI1, BI5
03	0603005A / 441: Combat Vehicle Mobilty	0603119A / BK9, 0603462A / BF7, BG4, BH6, BI8, BJ1, BJ6
03	0603005A / 497: Combat Vehicle Electro	0603462A / BH8
03	0603005A / 515: Robotic Ground Systems	0603462A / BF2, BF4, BK1
03	0603006A / 592: Space Application Tech	0603463A / AO6
03	0603015A / S29: Modeling & Simulation - Adv Tech Dev	0603118A / BC8, BE9
03	0603015A / S31: Modeling And Simulation Infrastructure Technology	0603118A / BC4, BC8, BE9
03	0603125A / DF5: Agile Integration & Demonstration	0602145A / BH5, BI4
03	0603125A / DW4: Energy Technologies (Congressional Adds (CAs))	0602145A / BH5, BI4
03	0603270A / CY3: Offensive Cyber Operations Mirror Adv Tech	0603463A / AQ4
03	0603270A / K15: Advanced Comm Ecm Demo	0603463A / AN8, AO7, AO3, AO1
03	0603270A / K16: Non-Commo Ecm Tech Dem	0603465A / AK3, 0603462A / BG7, 0603463A / AO1
03	0603313A / 206: Missile Simulation	0603464A / AF4

03	0603313A / 263: Future Msl Tech Integr(FMTI)	0603464A / AE8, AE9, AH3, BS3, 0603462A / BG7
03	0603313A / 704: Advanced Missile Demo	0603466A / AC8 & AD4, 0603465A / AK5
03	0603606A / 608: Countermine & Bar Dev	0603118A / BC9, 0603462A / BJ8
03	0603606A / 683: Area Denial Sensors	0603462A / BG1
03	0603607A / 627: Jt Svc Sa Prog (JSSAP)	0603118A / AY5
03	0603710A / K70: Night Vision Adv Tech	0603118A / BC9, 0603462A / BI3, BG1, 0603463A / AQ5
03	0603710A / K86: Night Vision, Abn Sys	0603465A / AK3, AL6, AL7
03	0603728A / 002: Environmental Compliance Technology	0603119A / BK8
03	0603728A / 03E: Environmental Restoration Technology	0603119A / BM1, 0603463A / AR4, AR6
03	0603734A / T08: Combat Eng Systems	0603119A / BL6, BL8, BM1, 0603462A / BG3, 0603463A / AS9, AU6, AU4, AT8, AT3, AU1, 0603466A / AE3
03	0603772A / 101: Tactical Command and Control	0603462A / BH3, 0603463A / AW2, AW4, AR2, AV8
03	0603772A / 243: Sensors And Signals Processing	0603466A / AD6
03	0603794A / EL4: Tactical Comms and Networking Technology Int	0603463A / AP6, AP8, AM7, AP9, AN4, AN6, AO3, AQ1, AO1
03	0603794A / EL5: Secure Tactical Information Integration	0603463A / AP2, AO9
04	0603774A / VT7: Soldier Maneuver Sensors - Adv Dev	0603774A / BQ5
04	0604120A / ED5: Assured Positioning, Navigation and Timing (PNT)	1206120A / FJ8
04	0604120A / EH8: DISMOUNTED	1206120A / FJ9
04	0604120A / EH9: PSEUDOLITES	1206120A / FK1
04	0604120A / EJ2: MOUNTED	1206120A / FK2
04	0604120A / EJ3: ANTI-JAM ANTENNA	1206120A / FK3
04	0604319A / DU3: IFPC2	0605052A / EY7
05	0604710A / L67: Soldier Night Vision Devices	0604710A / BQ6
05	0604798A / FG7: Emerging Technology Initiatives	0605054A / FI3
05	0605013A / 738: AcqBiz	0605013A / FL9
05	0605053A / FB8: Soldier Borne Sensor (SBS)	0604827A / FK4
06	0604256A / 976: Army Threat Sim (ATS)	0604759A / FF1
07	0205402A / EF2: Integrated Base Defense	0604785A / DS4

Program Terminations:

Budget Activity	***OSDPE / Project***	***OSDPE Title / Project Title***
01	0601103A / V72	University Research Initiatives / Minerva
01	0601104A / H09	University and Industry Research Centers / Robotics CTA
01	0601104A / H50	University and Industry Research Centers / Network Sciences Cta
02	0602105A / H7G	Materials Technology / Nanomaterials Applied Research
02	0602120A / SA2	Sensors and Electronic Survivability / Biotechnology Applied Research
02	0602624A / H19	Weapons and Munitions Technology / Asymmetric & Counter Measure Technologies
02	0602705A / H17	Electronics and Electronic Devices / Flexible Display Center
02	0602720A / 895	Environmental Quality Technology / Pollution Prevention
02	0602786A / 283	Warfighter Technology / Airdrop Adv Tech
02	0602786A / VT4	Warfighter Technology / Expeditionary Mobile Base Camp Technology
03	0603001A / 543	Warfighter Advanced Technology / Ammunition Logistics
03	0603001A / VT5	Warfighter Advanced Technology / Expeditionary Mobile Base Camp Demonstration
03	0603002A / ET5	Medical Advanced Technology / Adv Tech Dev in Clinical & Rehabilitative Medicine
03	0603728A / 025	Environmental Quality Technology Demonstrations / Pollution Prevention Technology
04	0603619A / 606	Landmine Warfare and Barrier - Adv Dev / Cntrmn/Barrier Adv Dev
04	0603639A / EL8	Tank and Medium Caliber Ammunition / LIGHTWEIGHT CARTRIDGE CASE FOR SMALL CALIBER
04	0603804A / EW8	Logistics and Engineer Equipment - Adv Dev / Armored Engineer Vehicles
04	0603804A / K39	Logistics and Engineer Equipment - Adv Dev / Field Sustainment Support Ad
04	0603804A / K41	Logistics and Engineer Equipment - Adv Dev / Water And Petroleum Distribution - Ad
04	0603804A / VR8	Logistics and Engineer Equipment - Adv Dev / Combat Service Support Systems - Ad
04	0604020A / CF1	Cross Functional Team (CFT) Advanced Development & Prototyping / CFT Advanced Development & Prototyping
04	0604115A / DS3	Technology Maturation Initiatives / Technology Maturation Initiatives
04	1206308A / FE6	Army Space Systems Integration / Army Space System Enhancement/Integration
05	0210609A / ED8	Paladin Integrated Management (PIM) / Paladin Integrated Management (PIM)
05	0604321A / B41	All Source Analysis System / CI/HUMINT Software Products (MIP)
05	0604321A / B51	All Source Analysis System / Machine - Foreign Language Translation System
05	0604601A / S62	Infantry Support Weapons / Counter-Defilade Target Engagement - SDD

05	0604601A / S70	Infantry Support Weapons / Personnel Recovery Support System (PRSS)
05	0604622A / E50	Family of Heavy Tactical Vehicles / TRAILER DEVELOPMENT
05	0604713A / EL2	Combat Feeding, Clothing, and Equipment / Army Field Feeding Equipment
05	0604741A / FG5	Air Defense Command, Control and Intelligence - Eng Dev / Counter Unmanned Aerial Systems (UAS)
05	0604768A / P01	Brilliant Anti-Armor Submunition (BAT) / MULTI - MODE SEEKER DEVELOPMENT AND TEST
05	0604780A / 571	Combined Arms Tactical Trainer (CATT) Core / Close Cbt Tact Trainer
05	0604780A / 577	Combined Arms Tactical Trainer (CATT) Core / Gaming Technology In Support Of Army Training
05	0604780A / 585	Combined Arms Tactical Trainer (CATT) Core / Aviation Combined Arms Tactical Trainer
05	0604804A / EC9	Logistics and Engineer Equipment - Eng Dev / Contingency Basing Infrastructure
05	0604804A / H01	Logistics and Engineer Equipment - Eng Dev / Combat Engineer Eq Ed
05	0604804A / H14	Logistics and Engineer Equipment - Eng Dev / Materials Handling Equipment - Ed
05	0604804A / VR7	Logistics and Engineer Equipment - Eng Dev / Combat Service Support Systems
05	0604818A / 334	Army Tactical Command & Control Hardware & Software / Common Software
05	0604823A / L87	Firefinder / Hypervelocity Armament System (HAS)
05	0604827A / EY3	Soldier Systems - Warrior Dem/Val / Soldier Power Generator
05	0605013A / FE9	Information Technology Development / ALTESS (P&R Forms)
05	0605029A / EQ2	Integrated Ground Security Surveillance Response Capability (IGSSR-C) / IntegGrdSecSurvRespC(IGSSR-C)
05	0605037A / EQ6	Evidence Collection and Detainee Processing / Evidence Collection and Detainee Processing
05	0605380A / EG6	AMF Joint Tactical Radio System (JTRS) / Small Airborne Networking Radio (SANR)
06	0303260A / FA9	Defense Military Deception Initiative / Security Initiatives
06	0604759A / 986	Major T&E Investment / Major Operational Test Instrumentation
06	0604759A / FA4	Major T&E Investment / Warrior Injury Assessment Manikin (WIAMan)
06	0605803A / 720	Technical Information Activities / Tech Info Func Actv
06	0605803A / 730	Technical Information Activities / Pers & Trng Analys Act
06	0605803A / C16	Technical Information Activities / FAST
06	0605803A / C18	Technical Information Activities / BAST
07	0203735A / 431	Combat Vehicle Improvement Programs / M113 IMPROVEMENTS
07	0203735A / FD8	Combat Vehicle Improvement Programs / Light Armored Vehicle Improvement
07	0203740A / 484	Maneuver Control System / Maneuver Control System
07	0203801A / DT5	Missile/Air Defense Product Improvement Program / Stinger Product Improvement

07	0203802A / 788	Other Missile Product Improvement Programs / ATACMS PIP
07	0205410A / EE9	Materials Handling Equipment / Material Handling Equipment - Advance Development
07	0303140A / FF8	Information Systems Security Program / Unit Activity Monitoring (UAM)
07	0303150A / EA5	WWMCCS/Global Command and Control System / Strategic and Joint Mission Command
07	0305219A / MQ1	MQ-1 Gray Eagle UAV / MQ-1 Gray Eagle - Army UAV (MIP)
07	0607135A / ES2	Apache Product Improvement Program / Apache Product Improvement Program
07	0607140A / ES7	Emerging Technologies from NIE / Emerging Technologies from NIE
07	0607665A / DT2	Family of Biometrics / Non-MIP Biometrics

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.

Department of Defense
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

12 Feb 2019

Appropriation	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted
Research, Development, Test & Eval, Army	11,633,461	11,074,556	300,604	11,375,160
Total Research, Development, Test & Evaluation	11,633,461	11,074,556	300,604	11,375,160

Department of Defense
FY 2020 President's Budget
Exhibit R-1 FY 2020 President's Budget
Total Obligational Authority
(Dollars in Thousands)

12 Feb 2019

Appropriation	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)
Research, Development, Test & Eval, Army	12,192,771		204,124	204,124	12,396,895
Total Research, Development, Test & Evaluation	12,192,771		204,124	204,124	12,396,895

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Summary Recap of Budget Activities	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted
Basic Research	464,187	506,444		506,444
Applied Research	1,342,832	1,578,725		1,578,725
Advanced Technology Development	1,503,959	1,585,778		1,585,778
Advanced Component Development & Prototypes	1,563,615	1,264,647	4,000	1,268,647
System Development & Demonstration	3,349,488	2,965,361	236,863	3,202,224
RDT&E Management Support	1,579,102	1,438,536		1,438,536
Operational Systems Development	1,830,278	1,735,065	59,741	1,794,806
Total Research, Development, Test & Evaluation	11,633,461	11,074,556	300,604	11,375,160

Summary Recap of FYDP Programs				
General Purpose Forces	668,082	666,757	10,000	676,757
Intelligence and Communications	401,118	252,771	40,613	293,384
Research and Development	10,369,821	9,830,755	249,991	10,080,746
Central Supply and Maintenance	118,410	108,696		108,696
Administration and Associated Activities	654			
Space	68,222	209,622		209,622
Classified Programs	7,154	5,955		5,955
Total Research, Development, Test & Evaluation	11,633,461	11,074,556	300,604	11,375,160

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Summary Recap of Budget Activities	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)
Basic Research	454,980				454,980
Applied Research	893,990				893,990
Advanced Technology Development	1,099,564				1,099,564
Advanced Component Development & Prototypes	2,929,355		17,114	17,114	2,946,469
System Development & Demonstration	3,549,431		111,917	111,917	3,661,348
RDT&E Management Support	1,286,625		1,875	1,875	1,288,500
Operational Systems Development	1,978,826		73,218	73,218	2,052,044
Total Research, Development, Test & Evaluation	12,192,771		204,124	204,124	12,396,895
Summary Recap of FYDP Programs					
General Purpose Forces	866,366				866,366
Intelligence and Communications	257,681		76,418	76,418	334,099
Research and Development	10,659,601		127,706	127,706	10,787,307
Central Supply and Maintenance	59,848				59,848
Administration and Associated Activities					
Space	342,002				342,002
Classified Programs	7,273				7,273
Total Research, Development, Test & Evaluation	12,192,771		204,124	204,124	12,396,895

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Summary Recap of Budget Activities	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted
Basic Research	464,187	506,444		506,444
Applied Research	1,342,832	1,578,725		1,578,725
Advanced Technology Development	1,503,959	1,585,778		1,585,778
Advanced Component Development & Prototypes	1,563,615	1,264,647	4,000	1,268,647
System Development & Demonstration	3,349,488	2,965,361	236,863	3,202,224
RDT&E Management Support	1,579,102	1,438,536		1,438,536
Operational Systems Development	1,830,278	1,735,065	59,741	1,794,806
Total Research, Development, Test & Evaluation	11,633,461	11,074,556	300,604	11,375,160

Summary Recap of FYDP Programs				
General Purpose Forces	668,082	666,757	10,000	676,757
Intelligence and Communications	401,118	252,771	40,613	293,384
Research and Development	10,369,821	9,830,755	249,991	10,080,746
Central Supply and Maintenance	118,410	108,696		108,696
Administration and Associated Activities	654			
Space	68,222	209,622		209,622
Classified Programs	7,154	5,955		5,955
Total Research, Development, Test & Evaluation	11,633,461	11,074,556	300,604	11,375,160

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Summary Recap of Budget Activities	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)
Basic Research	454,980				454,980
Applied Research	893,990				893,990
Advanced Technology Development	1,099,564				1,099,564
Advanced Component Development & Prototypes	2,929,355		17,114	17,114	2,946,469
System Development & Demonstration	3,549,431		111,917	111,917	3,661,348
RDT&E Management Support	1,286,625		1,875	1,875	1,288,500
Operational Systems Development	1,978,826		73,218	73,218	2,052,044
Total Research, Development, Test & Evaluation	12,192,771		204,124	204,124	12,396,895
Summary Recap of FYDP Programs					
General Purpose Forces	866,366				866,366
Intelligence and Communications	257,681		76,418	76,418	334,099
Research and Development	10,659,601		127,706	127,706	10,787,307
Central Supply and Maintenance	59,848				59,848
Administration and Associated Activities					
Space	342,002				342,002
Classified Programs	7,273				7,273
Total Research, Development, Test & Evaluation	12,192,771		204,124	204,124	12,396,895

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Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
1	0601101A	In-House Laboratory Independent Research	01	11,783	11,579		11,579	U
2	0601102A	Defense Research Sciences	01	274,098	315,660		315,660	U
3	0601103A	University Research Initiatives	01	74,349	65,202		65,202	U
4	0601104A	University and Industry Research Centers	01	103,957	114,003		114,003	U
5	0601121A	Cyber Collaborative Research Alliance	01					U
	Basic Research			464,187	506,444		506,444	
6	0602105A	Materials Technology	02	73,136	83,586		83,586	U
7	0602120A	Sensors and Electronic Survivability	02	83,581	80,849		80,849	U
8	0602122A	TRACTOR HIP	02	8,627	8,674		8,674	U
9	0602126A	TRACTOR JACK	02		400		400	U
10	0602141A	Lethality Technology	02					U
11	0602142A	Army Applied Research	02					U
12	0602143A	Soldier Lethality Technology	02					U
13	0602144A	Ground Technology	02					U
14	0602145A	Next Generation Combat Vehicle Technology	02					U
15	0602146A	Network C3I Technology	02					U
16	0602147A	Long Range Precision Fires Technology	02					U
17	0602148A	Future Verticle Lift Technology	02					U

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Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Sec
1	0601101A	In-House Laboratory Independent Research	01						U
2	0601102A	Defense Research Sciences	01	297,976				297,976	U
3	0601103A	University Research Initiatives	01	65,858				65,858	U
4	0601104A	University and Industry Research Centers	01	86,164				86,164	U
5	0601121A	Cyber Collaborative Research Alliance	01	4,982				4,982	U
	Basic Research			454,980				454,980	
6	0602105A	Materials Technology	02						U
7	0602120A	Sensors and Electronic Survivability	02						U
8	0602122A	TRACTOR HIP	02						U
9	0602126A	TRACTOR JACK	02						U
10	0602141A	Lethality Technology	02	26,961				26,961	U
11	0602142A	Army Applied Research	02	25,319				25,319	U
12	0602143A	Soldier Lethality Technology	02	115,274				115,274	U
13	0602144A	Ground Technology	02	35,199				35,199	U
14	0602145A	Next Generation Combat Vehicle Technology	02	219,047				219,047	U
15	0602146A	Network C3I Technology	02	114,516				114,516	U
16	0602147A	Long Range Precision Fires Technology	02	74,327				74,327	U
17	0602148A	Future Verticle Lift Technology	02	93,601				93,601	U

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Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
18	0602150A	Air and Missile Defense Technology	02					U
19	0602211A	Aviation Technology	02	72,170	81,805		81,805	U
20	0602213A	C3I Applied Cyber	02					U
21	0602270A	Electronic Warfare Technology	02	33,683	25,558		25,558	U
22	0602303A	Missile Technology	02	52,858	91,647		91,647	U
23	0602307A	Advanced Weapons Technology	02	36,959	44,468		44,468	U
24	0602308A	Advanced Concepts and Simulation	02	27,662	28,470		28,470	U
25	0602601A	Combat Vehicle and Automotive Technology	02	78,759	104,404		104,404	U
26	0602618A	Ballistics Technology	02	83,299	85,491		85,491	U
27	0602622A	Chemical, Smoke and Equipment Defeating Technology	02	3,895	5,027		5,027	U
28	0602623A	Joint Service Small Arms Program	02	6,473	12,380		12,380	U
29	0602624A	Weapons and Munitions Technology	02	241,344	383,410		383,410	U
30	0602705A	Electronics and Electronic Devices	02	90,613	96,760		96,760	U
31	0602709A	Night Vision Technology	02	38,243	33,573		33,573	U
32	0602712A	Countermine Systems	02	25,329	27,223		27,223	U
33	0602716A	Human Factors Engineering Technology	02	23,813	24,121		24,121	U
34	0602720A	Environmental Quality Technology	02	34,118	19,469		19,469	U
35	0602782A	Command, Control, Communications Technology	02	32,458	54,956		54,956	U
36	0602783A	Computer and Software Technology	02	13,707	14,948		14,948	U

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18	0602150A	Air and Missile Defense Technology	02	50,771				50,771	U
19	0602211A	Aviation Technology	02						U
20	0602213A	C3I Applied Cyber	02	18,947				18,947	U
21	0602270A	Electronic Warfare Technology	02						U
22	0602303A	Missile Technology	02						U
23	0602307A	Advanced Weapons Technology	02						U
24	0602308A	Advanced Concepts and Simulation	02						U
25	0602601A	Combat Vehicle and Automotive Technology	02						U
26	0602618A	Ballistics Technology	02						U
27	0602622A	Chemical, Smoke and Equipment Defeating Technology	02						U
28	0602623A	Joint Service Small Arms Program	02						U
29	0602624A	Weapons and Munitions Technology	02						U
30	0602705A	Electronics and Electronic Devices	02						U
31	0602709A	Night Vision Technology	02						U
32	0602712A	Countermine Systems	02						U
33	0602716A	Human Factors Engineering Technology	02						U
34	0602720A	Environmental Quality Technology	02						U
35	0602782A	Command, Control, Communications Technology	02						U
36	0602783A	Computer and Software Technology	02						U

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37	0602784A	Military Engineering Technology	02	114,947	101,124		101,124	U
38	0602785A	Manpower/Personnel/Training Technology	02	19,791	21,847		21,847	U
39	0602786A	Warfighter Technology	02	58,476	56,532		56,532	U
40	0602787A	Medical Technology	02	88,891	92,003		92,003	U
		Applied Research		1,342,832	1,578,725		1,578,725	
41	0603001A	Warfighter Advanced Technology	03	53,763	41,795		41,795	U
42	0603002A	Medical Advanced Technology	03	103,908	101,442		101,442	U
43	0603003A	Aviation Advanced Technology	03	172,545	169,411		169,411	U
44	0603004A	Weapons and Munitions Advanced Technology	03	195,345	241,581		241,581	U
45	0603005A	Combat Vehicle and Automotive Advanced Technology	03	154,084	176,622		176,622	U
46	0603006A	Space Application Advanced Technology	03	39,277	48,985		48,985	U
47	0603007A	Manpower, Personnel and Training Advanced Technology	03	5,063	8,038		8,038	U
48	0603009A	TRACTOR HIKE	03	39,302	22,631		22,631	U
49	0603015A	Next Generation Training & Simulation Systems	03	15,778	28,650		28,650	U
50	0603117A	Army Advanced Technology Development	03					U
51	0603118A	Soldier Lethality Advanced Technology	03					U
52	0603119A	Ground Advanced Technology	03					U

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Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Sec
37	0602784A	Military Engineering Technology	02						U
38	0602785A	Manpower/Personnel/Training Technology	02	20,873				20,873	U
39	0602786A	Warfighter Technology	02						U
40	0602787A	Medical Technology	02	99,155				99,155	U
		Applied Research		893,990				893,990	
41	0603001A	Warfighter Advanced Technology	03						U
42	0603002A	Medical Advanced Technology	03	42,030				42,030	U
43	0603003A	Aviation Advanced Technology	03						U
44	0603004A	Weapons and Munitions Advanced Technology	03						U
45	0603005A	Combat Vehicle and Automotive Advanced Technology	03						U
46	0603006A	Space Application Advanced Technology	03						U
47	0603007A	Manpower, Personnel and Training Advanced Technology	03	11,038				11,038	U
48	0603009A	TRACTOR HIKE	03						U
49	0603015A	Next Generation Training & Simulation Systems	03						U
50	0603117A	Army Advanced Technology Development	03	63,338				63,338	U
51	0603118A	Soldier Lethality Advanced Technology	03	118,468				118,468	U
52	0603119A	Ground Advanced Technology	03	12,593				12,593	U

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Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
53	0603125A	Combating Terrorism - Technology Development	03	44,088	36,757		36,757	U
54	0603130A	TRACTOR NAIL	03	4,880	4,896		4,896	U
55	0603131A	TRACTOR EGGS	03	4,326	6,041		6,041	U
56	0603270A	Electronic Warfare Technology	03	33,249	41,458		41,458	U
57	0603313A	Missile and Rocket Advanced Technology	03	133,433	94,561		94,561	U
58	0603322A	TRACTOR CAGE	03	12,323	16,845		16,845	U
59	0603457A	C3I Cyber Advanced Development	03					U
60	0603461A	High Performance Computing Modernization Program	03	214,100	218,098		218,098	U
61	0603462A	Next Generation Combat Vehicle Advanced Technology	03					U
62	0603463A	Network C3I Advanced Technology	03					U
63	0603464A	Long Range Precision Fires Advanced Technology	03					U
64	0603465A	Future Vertical Lift Advanced Technology	03					U
65	0603466A	Air and Missile Defense Advanced Technology	03					U
66	0603606A	Landmine Warfare and Barrier Advanced Technology	03	18,473	17,097		17,097	U
67	0603607A	Joint Service Small Arms Program	03	5,628	22,799		22,799	U
68	0603710A	Night Vision Advanced Technology	03	45,617	61,313		61,313	U

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Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Sec
53	0603125A	Combating Terrorism - Technology Development	03						U
54	0603130A	TRACTOR NAIL	03						U
55	0603131A	TRACTOR EGGS	03						U
56	0603270A	Electronic Warfare Technology	03						U
57	0603313A	Missile and Rocket Advanced Technology	03						U
58	0603322A	TRACTOR CAGE	03						U
59	0603457A	C3I Cyber Advanced Development	03	13,769				13,769	U
60	0603461A	High Performance Computing Modernization Program	03	184,755				184,755	U
61	0603462A	Next Generation Combat Vehicle Advanced Technology	03	160,035				160,035	U
62	0603463A	Network C3I Advanced Technology	03	106,899				106,899	U
63	0603464A	Long Range Precision Fires Advanced Technology	03	174,386				174,386	U
64	0603465A	Future Vertical Lift Advanced Technology	03	151,640				151,640	U
65	0603466A	Air and Missile Defense Advanced Technology	03	60,613				60,613	U
66	0603606A	Landmine Warfare and Barrier Advanced Technology	03						U
67	0603607A	Joint Service Small Arms Program	03						U
68	0603710A	Night Vision Advanced Technology	03						U

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Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
69	0603728A	Environmental Quality Technology Demonstrations	03	29,150	29,132		29,132	U
70	0603734A	Military Engineering Advanced Technology	03	96,586	101,438		101,438	U
71	0603772A	Advanced Tactical Computer Science and Sensor Technology	03	50,637	43,856		43,856	U
72	0603794A	C3 Advanced Technology	03	32,404	52,332		52,332	U
		Advanced Technology Development		1,503,959	1,585,778		1,585,778	
73	0603305A	Army Missle Defense Systems Integration	04	23,558	60,472		60,472	U
74	0603327A	Air and Missile Defense Systems Engineering	04	58,812	45,231	1,000	46,231	U
75	0603619A	Landmine Warfare and Barrier - Adv Dev	04	69,237	45,198		45,198	U
76	0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04	8,920	20,674		20,674	U
77	0603639A	Tank and Medium Caliber Ammunition	04	45,448	41,921		41,921	U
78	0603645A	Armored System Modernization - Adv Dev	04	41,431	84,297		84,297	U
79	0603747A	Soldier Support and Survivability	04	15,759	8,735	3,000	11,735	U
80	0603766A	Tactical Electronic Surveillance System - Adv Dev	04	27,733	35,667		35,667	U
81	0603774A	Night Vision Systems Advanced Development	04	501,816	7,341		7,341	U
82	0603779A	Environmental Quality Technology - Dem/Val	04	15,039	14,731		14,731	U

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Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Sec
69	0603728A	Environmental Quality Technology Demonstrations	03						U
70	0603734A	Military Engineering Advanced Technology	03						U
71	0603772A	Advanced Tactical Computer Science and Sensor Technology	03						U
72	0603794A	C3 Advanced Technology	03						U
		Advanced Technology Development		1,099,564				1,099,564	
73	0603305A	Army Missle Defense Systems Integration	04	10,987				10,987	U
74	0603327A	Air and Missile Defense Systems Engineering	04	15,148		500	500	15,648	U
75	0603619A	Landmine Warfare and Barrier - Adv Dev	04	92,915				92,915	U
76	0603627A	Smoke, Obscurant and Target Defeating Sys-Adv Dev	04						U
77	0603639A	Tank and Medium Caliber Ammunition	04	82,146				82,146	U
78	0603645A	Armored System Modernization - Adv Dev	04	157,656				157,656	U
79	0603747A	Soldier Support and Survivability	04	6,514		3,000	3,000	9,514	U
80	0603766A	Tactical Electronic Surveillance System - Adv Dev	04	34,890				34,890	U
81	0603774A	Night Vision Systems Advanced Development	04	251,011				251,011	U
82	0603779A	Environmental Quality Technology - Dem/Val	04	15,132				15,132	U

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83	0603790A	NATO Research and Development	04	2,485	3,682		3,682	U
84	0603801A	Aviation - Adv Dev	04	9,653	86,180		86,180	U
85	0603804A	Logistics and Engineer Equipment - Adv Dev	04	29,619	17,230		17,230	U
86	0603807A	Medical Systems - Adv Dev	04	36,279	39,244		39,244	U
87	0603827A	Soldier Systems - Advanced Development	04	60,774	31,022		31,022	U
88	0604017A	Robotics Development	04	38,051	74,368		74,368	U
89	0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping	04		9,488		9,488	U
90	0604021A	Electronic Warfare Technology Maturation (MIP)	04					U
91	0604100A	Analysis Of Alternatives	04	7,307	9,753		9,753	U
92	0604113A	Future Tactical Unmanned Aircraft System (FTUAS)	04		12,393		12,393	U
93	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04	57,437	89,248		89,248	U
94	0604115A	Technology Maturation Initiatives	04	145,618	95,229		95,229	U
95	0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04	19,201	79,016		79,016	U
96	0604118A	TRACTOR BEAM	04	10,400	52,894		52,894	U
97	0604119A	Army Advanced Component Development & Prototyping	04					U
98	0604120A	Assured Positioning, Navigation and Timing (PNT)	04	132,810				U

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83	0603790A	NATO Research and Development	04	5,406				5,406	U
84	0603801A	Aviation - Adv Dev	04	459,290				459,290	U
85	0603804A	Logistics and Engineer Equipment - Adv Dev	04	6,254		1,085	1,085	7,339	U
86	0603807A	Medical Systems - Adv Dev	04	31,175				31,175	U
87	0603827A	Soldier Systems - Advanced Development	04	22,113				22,113	U
88	0604017A	Robotics Development	04	115,222				115,222	U
89	0604020A	Cross Functional Team (CFT) Advanced Development & Prototyping	04						U
90	0604021A	Electronic Warfare Technology Maturation (MIP)	04	18,043				18,043	U
91	0604100A	Analysis Of Alternatives	04	10,023				10,023	U
92	0604113A	Future Tactical Unmanned Aircraft System (FTUAS)	04	40,745				40,745	U
93	0604114A	Lower Tier Air Missile Defense (LTAMD) Sensor	04	427,772				427,772	U
94	0604115A	Technology Maturation Initiatives	04	196,676				196,676	U
95	0604117A	Maneuver - Short Range Air Defense (M-SHORAD)	04	33,100		6,000	6,000	39,100	U
96	0604118A	TRACTOR BEAM	04						U
97	0604119A	Army Advanced Component Development & Prototyping	04	115,116		4,529	4,529	119,645	U
98	0604120A	Assured Positioning, Navigation and Timing (PNT)	04						U

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99	0604121A	Synthetic Training Environment Refinement & Prototyping	04	109,165	39,890		39,890	U
100	0604182A	Hypersonics	04					U
101	0604319A	Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	04	10,871	40,979		40,979	U
102	0604403A	Future Interceptor	04					U
103	0604541A	Unified Network Transport	04					U
104	0604644A	Mobile Medium Range Missile	04					U
105	0604785A	Integrated Base Defense (Budget Activity 4)	04					U
106	0305251A	Cyberspace Operations Forces and Force Support	04	56,071	52,817		52,817	U
107	1206120A	Assured Positioning, Navigation and Timing (PNT)	04		128,640		128,640	U
108	1206308A	Army Space Systems Integration	04	30,121	38,307		38,307	U
		Advanced Component Development & Prototypes		1,563,615	1,264,647	4,000	1,268,647	
109	0604201A	Aircraft Avionics	05	30,812	32,253		32,253	U
110	0604270A	Electronic Warfare Development	05	68,935	58,627		58,627	U
111	0604321A	All Source Analysis System	05	4,774				U
112	0604328A	TRACTOR CAGE	05	30,252	17,050	12,000	29,050	U
113	0604601A	Infantry Support Weapons	05	99,145	63,793		63,793	U
114	0604604A	Medium Tactical Vehicles	05	5,798	3,699		3,699	U
115	0604611A	JAVELIN	05	20,252	5,616		5,616	U

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99	0604121A	Synthetic Training Environment Refinement & Prototyping	04	136,761				136,761	U
100	0604182A	Hypersonics	04	228,000				228,000	U
101	0604319A	Indirect Fire Protection Capability Increment 2-Intercept (IFPC2)	04						U
102	0604403A	Future Interceptor	04	8,000				8,000	U
103	0604541A	Unified Network Transport	04	39,600				39,600	U
104	0604644A	Mobile Medium Range Missile	04	20,000				20,000	U
105	0604785A	Integrated Base Defense (Budget Activity 4)	04			2,000	2,000	2,000	U
106	0305251A	Cyberspace Operations Forces and Force Support	04	52,102				52,102	U
107	1206120A	Assured Positioning, Navigation and Timing (PNT)	04	192,562				192,562	U
108	1206308A	Army Space Systems Integration	04	104,996				104,996	U
		Advanced Component Development & Prototypes		2,929,355		17,114	17,114	2,946,469	
109	0604201A	Aircraft Avionics	05	29,164				29,164	U
110	0604270A	Electronic Warfare Development	05	70,539				70,539	U
111	0604321A	All Source Analysis System	05						U
112	0604328A	TRACTOR CAGE	05						U
113	0604601A	Infantry Support Weapons	05	106,121				106,121	U
114	0604604A	Medium Tactical Vehicles	05	2,152				2,152	U
115	0604611A	JAVELIN	05	17,897				17,897	U

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116	0604622A	Family of Heavy Tactical Vehicles	05	10,086	11,935		11,935	U
117	0604633A	Air Traffic Control	05	3,433	12,332		12,332	U
118	0604642A	Light Tactical Wheeled Vehicles	05	3,619	1,276		1,276	U
119	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05	34,794	373,337		373,337	U
120	0604710A	Night Vision Systems - Eng Dev	05	184,389	144,442		144,442	U
121	0604713A	Combat Feeding, Clothing, and Equipment	05	8,561	4,502		4,502	U
122	0604715A	Non-System Training Devices - Eng Dev	05	51,900	44,381		44,381	U
123	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	190,385	93,073	119,300	212,373	U
124	0604742A	Constructive Simulation Systems Development	05	17,921	22,600		22,600	U
125	0604746A	Automatic Test Equipment Development	05	7,054	11,782		11,782	U
126	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05	10,890	9,134		9,134	U
127	0604768A	Brilliant Anti-Armor Submunition (BAT)	05	7,886	6,886		6,886	U
128	0604780A	Combined Arms Tactical Trainer (CATT) Core	05	17,855	21,936		21,936	U
129	0604798A	Brigade Analysis, Integration and Evaluation	05	139,386	49,250		49,250	U
130	0604802A	Weapons and Munitions - Eng Dev	05	144,389	172,744		172,744	U

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116	0604622A	Family of Heavy Tactical Vehicles	05	16,745				16,745	U
117	0604633A	Air Traffic Control	05	6,989				6,989	U
118	0604642A	Light Tactical Wheeled Vehicles	05	10,465				10,465	U
119	0604645A	Armored Systems Modernization (ASM) - Eng Dev	05	310,152				310,152	U
120	0604710A	Night Vision Systems - Eng Dev	05	181,732				181,732	U
121	0604713A	Combat Feeding, Clothing, and Equipment	05	2,393				2,393	U
122	0604715A	Non-System Training Devices - Eng Dev	05	27,412				27,412	U
123	0604741A	Air Defense Command, Control and Intelligence - Eng Dev	05	43,502				43,502	U
124	0604742A	Constructive Simulation Systems Development	05	11,636				11,636	U
125	0604746A	Automatic Test Equipment Development	05	10,915				10,915	U
126	0604760A	Distributive Interactive Simulations (DIS) - Eng Dev	05	7,801				7,801	U
127	0604768A	Brilliant Anti-Armor Submunition (BAT)	05	25,000				25,000	U
128	0604780A	Combined Arms Tactical Trainer (CATT) Core	05	9,241				9,241	U
129	0604798A	Brigade Analysis, Integration and Evaluation	05	42,634				42,634	U
130	0604802A	Weapons and Munitions - Eng Dev	05	181,023				181,023	U

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131	0604804A	Logistics and Engineer Equipment - Eng Dev	05	76,030	76,388		76,388	U
132	0604805A	Command, Control, Communications Systems - Eng Dev	05	9,559	15,950		15,950	U
133	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05	36,685	44,495		44,495	U
134	0604808A	Landmine Warfare/Barrier - Eng Dev	05	26,188	43,064		43,064	U
135	0604818A	Army Tactical Command & Control Hardware & Software	05	157,852	169,607		169,607	U
136	0604820A	Radar Development	05	31,651	39,289		39,289	U
137	0604822A	General Fund Enterprise Business System (GFEBS)	05	47,575	36,810		36,810	U
138	0604823A	Firefinder	05	43,762	27,439		27,439	U
139	0604827A	Soldier Systems - Warrior Dem/Val	05	15,490	10,382		10,382	U
140	0604852A	Suite of Survivability Enhancement Systems - EMD	05	90,187	52,839		52,839	U
141	0604854A	Artillery Systems - EMD	05	3,892	1,779		1,779	U
142	0605013A	Information Technology Development	05	62,613	77,686		77,686	U
143	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05	188,637	164,899		164,899	U
144	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05	184,300	111,821		111,821	U
145	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05	4,241	3,207		3,207	U
146	0605030A	Joint Tactical Network Center (JTNC)	05	15,242	15,869		15,869	U

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131	0604804A	Logistics and Engineer Equipment - Eng Dev	05	103,226				103,226	U
132	0604805A	Command, Control, Communications Systems - Eng Dev	05	12,595				12,595	U
133	0604807A	Medical Materiel/Medical Biological Defense Equipment - Eng Dev	05	48,264				48,264	U
134	0604808A	Landmine Warfare/Barrier - Eng Dev	05	39,208				39,208	U
135	0604818A	Army Tactical Command & Control Hardware & Software	05	140,637				140,637	U
136	0604820A	Radar Development	05	105,243				105,243	U
137	0604822A	General Fund Enterprise Business System (GFEBS)	05	46,683				46,683	U
138	0604823A	Firefinder	05	17,294				17,294	U
139	0604827A	Soldier Systems - Warrior Dem/Val	05	5,803				5,803	U
140	0604852A	Suite of Survivability Enhancement Systems - EMD	05	98,698				98,698	U
141	0604854A	Artillery Systems - EMD	05	15,832				15,832	U
142	0605013A	Information Technology Development	05	126,537				126,537	U
143	0605018A	Integrated Personnel and Pay System-Army (IPPS-A)	05	142,773				142,773	U
144	0605028A	Armored Multi-Purpose Vehicle (AMPV)	05	96,730				96,730	U
145	0605029A	Integrated Ground Security Surveillance Response Capability (IGSSR-C)	05	6,699				6,699	U
146	0605030A	Joint Tactical Network Center (JTNC)	05	15,882				15,882	U

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147	0605031A	Joint Tactical Network (JTN)	05	46,051	41,920		41,920	U
148	0605032A	TRACTOR TIRE	05	118,570	41,166	66,760	107,926	U
149	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05	20,661	5,169		5,169	U
150	0605034A	Tactical Security System (TSS)	05	3,998	4,490		4,490	U
151	0605035A	Common Infrared Countermeasures (CIRCM)	05	97,746	31,139	2,670	33,809	U
152	0605036A	Combating Weapons of Mass Destruction (CWMD)	05	6,650	11,297		11,297	U
153	0605037A	Evidence Collection and Detainee Processing	05	206				U
154	0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite	05	15,481	15,135		15,135	U
155	0605041A	Defensive CYBER Tool Development	05	41,441	33,796		33,796	U
156	0605042A	Tactical Network Radio Systems (Low-Tier)	05	8,845	3,825		3,825	U
157	0605047A	Contract Writing System	05	19,574	41,876		41,876	U
158	0605049A	Missile Warning System Modernization (MWSM)	05	12,480	8,266		8,266	U
159	0605051A	Aircraft Survivability Development	05	169,752	21,938	34,933	56,871	U
160	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05	156,361	132,283		132,283	U
161	0605053A	Ground Robotics	05	60,530	71,435		71,435	U

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147	0605031A	Joint Tactical Network (JTN)	05	40,808				40,808	U
148	0605032A	TRACTOR TIRE	05						U
149	0605033A	Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)	05	3,847				3,847	U
150	0605034A	Tactical Security System (TSS)	05	6,928				6,928	U
151	0605035A	Common Infrared Countermeasures (CIRCM)	05	34,488		11,770	11,770	46,258	U
152	0605036A	Combating Weapons of Mass Destruction (CWMD)	05	10,000				10,000	U
153	0605037A	Evidence Collection and Detainee Processing	05						U
154	0605038A	Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite	05	6,054				6,054	U
155	0605041A	Defensive CYBER Tool Development	05	62,262				62,262	U
156	0605042A	Tactical Network Radio Systems (Low-Tier)	05	35,654				35,654	U
157	0605047A	Contract Writing System	05	19,682				19,682	U
158	0605049A	Missile Warning System Modernization (MWSM)	05	1,539				1,539	U
159	0605051A	Aircraft Survivability Development	05	64,557		77,420	77,420	141,977	U
160	0605052A	Indirect Fire Protection Capability Inc 2 - Block 1	05	243,228				243,228	U
161	0605053A	Ground Robotics	05	41,308				41,308	U

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162	0605054A	Emerging Technology Initiatives	05		42,813		42,813	U
163	0605203A	Army System Development & Demonstration	05					U
164	0605380A	AMF Joint Tactical Radio System (JTRS)	05	18,639	15,964		15,964	U
165	0605450A	Joint Air-to-Ground Missile (JAGM)	05	28,539	11,758		11,758	U
166	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05	339,051	322,263		322,263	U
167	0605625A	Manned Ground Vehicle	05					U
168	0605766A	National Capabilities Integration (MIP)	05	9,382	12,340		12,340	U
169	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	22,530				U
170	0605830A	Aviation Ground Support Equipment	05	6,653	7,703		7,703	U
171	0210609A	Paladin Integrated Management (PIM)	05	5,868				U
172	0303032A	TROJAN - RH12	05	5,631	4,521	1,200	5,721	U
173	0303267A	Auctioned Spectrum Relocation Fund	05	15,885				U
174	0304270A	Electronic Warfare Development	05	14,616	8,922		8,922	U
175	1205117A	Tractor Bears	05	17,928	23,170		23,170	U
		System Development & Demonstration		3,349,488	2,965,361	236,863	3,202,224	
176	0604256A	Threat Simulator Development	06	31,401	47,322		47,322	U
177	0604258A	Target Systems Development	06	13,467	32,120		32,120	U

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162	0605054A	Emerging Technology Initiatives	05	45,896				45,896	U
163	0605203A	Army System Development & Demonstration	05	164,883		19,527	19,527	184,410	U
164	0605380A	AMF Joint Tactical Radio System (JTRS)	05						U
165	0605450A	Joint Air-to-Ground Missile (JAGM)	05	9,500				9,500	U
166	0605457A	Army Integrated Air and Missile Defense (AIAMD)	05	208,938				208,938	U
167	0605625A	Manned Ground Vehicle	05	378,400				378,400	U
168	0605766A	National Capabilities Integration (MIP)	05	7,835				7,835	U
169	0605812A	Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Ph	05	2,732				2,732	U
170	0605830A	Aviation Ground Support Equipment	05	1,664				1,664	U
171	0210609A	Paladin Integrated Management (PIM)	05						U
172	0303032A	TROJAN - RH12	05	3,936				3,936	U
173	0303267A	Auctioned Spectrum Relocation Fund	05						U
174	0304270A	Electronic Warfare Development	05	19,675		3,200	3,200	22,875	U
175	1205117A	Tractor Bears	05						U
		System Development & Demonstration		3,549,431		111,917	111,917	3,661,348	
176	0604256A	Threat Simulator Development	06	14,117				14,117	U
177	0604258A	Target Systems Development	06	8,327				8,327	U

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178	0604759A	Major T&E Investment	06	113,516	82,893		82,893	U
179	0605103A	Rand Arroyo Center	06	19,336	19,796		19,796	U
180	0605301A	Army Kwajalein Atoll	06	234,010	246,275		246,275	U
181	0605326A	Concepts Experimentation Program	06	28,701	30,394		30,394	U
182	0605502A	Small Business Innovative Research	06	284,080				U
183	0605601A	Army Test Ranges and Facilities	06	313,589	315,634		315,634	U
184	0605602A	Army Technical Test Instrumentation and Targets	06	57,395	84,805		84,805	U
185	0605604A	Survivability/Lethality Analysis	06	41,296	40,480		40,480	U
186	0605606A	Aircraft Certification	06	4,612	3,936		3,936	U
187	0605702A	Meteorological Support to RDT&E Activities	06	7,070	9,759		9,759	U
188	0605706A	Materiel Systems Analysis	06	21,694	21,223		21,223	U
189	0605709A	Exploitation of Foreign Items	06	12,684	13,026		13,026	U
190	0605712A	Support of Operational Testing	06	50,723	52,705		52,705	U
191	0605716A	Army Evaluation Center	06	56,003	57,039		57,039	U
192	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06	1,756	2,798		2,798	U
193	0605801A	Programwide Activities	06	54,383	60,921		60,921	U
194	0605803A	Technical Information Activities	06	39,613	29,024		29,024	U
195	0605805A	Munitions Standardization, Effectiveness and Safety	06	65,709	72,279		72,279	U

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Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Sec
178	0604759A	Major T&E Investment	06	136,565				136,565	U
179	0605103A	Rand Arroyo Center	06	13,113				13,113	U
180	0605301A	Army Kwajalein Atoll	06	238,691				238,691	U
181	0605326A	Concepts Experimentation Program	06	42,922				42,922	U
182	0605502A	Small Business Innovative Research	06						U
183	0605601A	Army Test Ranges and Facilities	06	334,468				334,468	U
184	0605602A	Army Technical Test Instrumentation and Targets	06	46,974				46,974	U
185	0605604A	Survivability/Lethality Analysis	06	35,075				35,075	U
186	0605606A	Aircraft Certification	06	3,461				3,461	U
187	0605702A	Meteorological Support to RDT&E Activities	06	6,233				6,233	U
188	0605706A	Materiel Systems Analysis	06	21,342				21,342	U
189	0605709A	Exploitation of Foreign Items	06	11,168				11,168	U
190	0605712A	Support of Operational Testing	06	52,723				52,723	U
191	0605716A	Army Evaluation Center	06	60,815				60,815	U
192	0605718A	Army Modeling & Sim X-Cmd Collaboration & Integ	06	2,527				2,527	U
193	0605801A	Programwide Activities	06	58,175				58,175	U
194	0605803A	Technical Information Activities	06	25,060				25,060	U
195	0605805A	Munitions Standardization, Effectiveness and Safety	06	44,458				44,458	U

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Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
196	0605857A	Environmental Quality Technology Mgmt Support	06	4,883	3,211		3,211	U
197	0605898A	Army Direct Report Headquarters - R&D - MHA	06	54,177	54,130		54,130	U
198	0606001A	Military Ground-Based CREW Technology	06	7,600	4,890		4,890	U
199	0606002A	Ronald Reagan Ballistic Missile Defense Test Site	06	59,042	62,940		62,940	U
200	0606003A	CounterIntel and Human Intel Modernization	06		2,636		2,636	U
201	0606942A	Assessments and Evaluations Cyber Vulnerabilities	06		88,300		88,300	U
202	0303260A	Defense Military Deception Initiative	06	1,708				U
203	0909999A	Financing for Cancelled Account Adjustments	06	654				U
	RDT&E	Management Support		1,579,102	1,438,536		1,438,536	
204	0603778A	MLRS Product Improvement Program	07	10,286	6,877		6,877	U
205	0603813A	TRACTOR PULL	07	4,014	4,067		4,067	U
206	0605024A	Anti-Tamper Technology Support	07	4,009	7,251		7,251	U
207	0607131A	Weapons and Munitions Product Improvement Programs	07	16,302	16,003	2,548	18,551	U
208	0607133A	TRACTOR SMOKE	07	12,143	4,577	7,780	12,357	U
209	0607134A	Long Range Precision Fires (LRPF)	07	80,690	159,278		159,278	U
210	0607135A	Apache Product Improvement Program	07	55,565	24,019		24,019	U

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Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Sec
196	0605857A	Environmental Quality Technology Mgmt Support	06	4,681				4,681	U
197	0605898A	Army Direct Report Headquarters - R&D - MHA	06	53,820				53,820	U
198	0606001A	Military Ground-Based CREW Technology	06	4,291				4,291	U
199	0606002A	Ronald Reagan Ballistic Missile Defense Test Site	06	62,069				62,069	U
200	0606003A	CounterIntel and Human Intel Modernization	06	1,050		1,875	1,875	2,925	U
201	0606942A	Assessments and Evaluations Cyber Vulnerabilities	06	4,500				4,500	U
202	0303260A	Defense Military Deception Initiative	06						U
203	0909999A	Financing for Cancelled Account Adjustments	06						U
	RDT&E	Management Support		1,286,625		1,875	1,875	1,288,500	
204	0603778A	MLRS Product Improvement Program	07	22,877				22,877	U
205	0603813A	TRACTOR PULL	07						U
206	0605024A	Anti-Tamper Technology Support	07	8,491				8,491	U
207	0607131A	Weapons and Munitions Product Improvement Programs	07	15,645				15,645	U
208	0607133A	TRACTOR SMOKE	07						U
209	0607134A	Long Range Precision Fires (LRPF)	07	164,182				164,182	U
210	0607135A	Apache Product Improvement Program	07						U

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Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
211	0607136A	Blackhawk Product Improvement Program	07	48,241	35,196		35,196	U
212	0607137A	Chinook Product Improvement Program	07	155,433	144,722		144,722	U
213	0607138A	Fixed Wing Product Improvement Program	07	7,782	2,280		2,280	U
214	0607139A	Improved Turbine Engine Program	07	167,532	188,903		188,903	U
215	0607140A	Emerging Technologies from NIE	07	26,112				U
216	0607142A	Aviation Rocket System Product Improvement and Development	07	9,662	38,452		38,452	U
217	0607143A	Unmanned Aircraft System Universal Products	07	36,926	38,331		38,331	U
218	0607145A	Apache Future Development	07					U
219	0607312A	Army Operational Systems Development	07					U
220	0607665A	Family of Biometrics	07	3,032	2,397		2,397	U
221	0607865A	Patriot Product Improvement	07	77,391	75,288		75,288	U
222	0203728A	Joint Automated Deep Operation Coordination System (JADOCS)	07	32,256	30,915		30,915	U
223	0203735A	Combat Vehicle Improvement Programs	07	293,921	336,063		336,063	U
224	0203740A	Maneuver Control System	07	6,443				U
225	0203743A	155mm Self-Propelled Howitzer Improvements	07	39,154	37,155		37,155	U
226	0203744A	Aircraft Modifications/Product Improvement Programs	07	34,228	17,684		17,684	U

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Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Sec
211	0607136A	Blackhawk Product Improvement Program	07	13,039				13,039	U
212	0607137A	Chinook Product Improvement Program	07	174,371				174,371	U
213	0607138A	Fixed Wing Product Improvement Program	07	4,545				4,545	U
214	0607139A	Improved Turbine Engine Program	07	206,434				206,434	U
215	0607140A	Emerging Technologies from NIE	07						U
216	0607142A	Aviation Rocket System Product Improvement and Development	07	24,221				24,221	U
217	0607143A	Unmanned Aircraft System Universal Products	07	32,016				32,016	U
218	0607145A	Apache Future Development	07	5,448				5,448	U
219	0607312A	Army Operational Systems Development	07	49,526				49,526	U
220	0607665A	Family of Biometrics	07	1,702				1,702	U
221	0607865A	Patriot Product Improvement	07	96,430				96,430	U
222	0203728A	Joint Automated Deep Operation Coordination System (JADOCS)	07	47,398				47,398	U
223	0203735A	Combat Vehicle Improvement Programs	07	334,463				334,463	U
224	0203740A	Maneuver Control System	07						U
225	0203743A	155mm Self-Propelled Howitzer Improvements	07	214,246				214,246	U
226	0203744A	Aircraft Modifications/Product Improvement Programs	07	16,486				16,486	U

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Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
227	0203752A	Aircraft Engine Component Improvement Program	07	139	146		146	U
228	0203758A	Digitization	07	4,611	6,308		6,308	U
229	0203801A	Missile/Air Defense Product Improvement Program	07	43,615	1,641	2,000	3,641	U
230	0203802A	Other Missile Product Improvement Programs	07	4,800	4,941		4,941	U
231	0203808A	TRACTOR CARD	07	37,883	34,050		34,050	U
232	0205402A	Integrated Base Defense - Operational System Dev	07			8,000	8,000	U
233	0205410A	Materials Handling Equipment	07	1,519	1,462		1,462	U
234	0205412A	Environmental Quality Technology - Operational System Dev	07	187	249		249	U
235	0205456A	Lower Tier Air and Missile Defense (AMD) System	07	69,558	77,188		77,188	U
236	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	93,900	118,955		118,955	U
238	0303028A	Security and Intelligence Activities	07	35,652	12,277	23,199	35,476	U
239	0303140A	Information Systems Security Program	07	108,755	42,520		42,520	U
240	0303141A	Global Combat Support System	07	45,372	53,855		53,855	U
241	0303150A	WWMCCS/Global Command and Control System	07	10,055	2,031		2,031	U
244	0305172A	Combined Advanced Applications	07	1,100	1,500		1,500	U
245	0305179A	Integrated Broadcast Service (IBS)	07		450		450	U

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Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Sec
227	0203752A	Aircraft Engine Component Improvement Program	07	144				144	U
228	0203758A	Digitization	07	5,270				5,270	U
229	0203801A	Missile/Air Defense Product Improvement Program	07	1,287				1,287	U
230	0203802A	Other Missile Product Improvement Programs	07						U
231	0203808A	TRACTOR CARD	07						U
232	0205402A	Integrated Base Defense - Operational System Dev	07						U
233	0205410A	Materials Handling Equipment	07						U
234	0205412A	Environmental Quality Technology - Operational System Dev	07	732				732	U
235	0205456A	Lower Tier Air and Missile Defense (AMD) System	07	107,746				107,746	U
236	0205778A	Guided Multiple-Launch Rocket System (GMLRS)	07	138,594				138,594	U
238	0303028A	Security and Intelligence Activities	07	13,845		22,904	22,904	36,749	U
239	0303140A	Information Systems Security Program	07	29,185				29,185	U
240	0303141A	Global Combat Support System	07	68,976				68,976	U
241	0303150A	WWMCCS/Global Command and Control System	07	2,073				2,073	U
244	0305172A	Combined Advanced Applications	07						U
245	0305179A	Integrated Broadcast Service (IBS)	07	459				459	U

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Line No	Program Element Number	Item	Act	FY 2018 (Base + OCO)	FY 2019 Base Enacted	FY 2019 OCO Enacted	FY 2019 Total Enacted	Sec
246	0305204A	Tactical Unmanned Aerial Vehicles	07	16,925	6,000		6,000	U
247	0305206A	Airborne Reconnaissance Systems	07	20,080	12,416	14,000	26,416	U
248	0305208A	Distributed Common Ground/Surface Systems	07	24,700	27,109		27,109	U
249	0305219A	MQ-1C Gray Eagle UAS	07	10,531				U
250	0305232A	RQ-11 UAV	07	12,691	6,180		6,180	U
251	0305233A	RQ-7 UAV	07	12,773	17,863		17,863	U
252	0307665A	Biometrics Enabled Intelligence	07	8,573	4,310	2,214	6,524	U
253	0708045A	End Item Industrial Preparedness Activities	07	118,410	108,696		108,696	U
254	1203142A	SATCOM Ground Environment (SPACE)	07	9,945	12,105		12,105	U
255	1208053A	Joint Tactical Ground System	07	10,228	7,400		7,400	U
9999	9999999999	Classified Programs		7,154	5,955		5,955	U
		Operational Systems Development		1,830,278	1,735,065	59,741	1,794,806	
		Total Research, Development, Test & Eval, Army		11,633,461	11,074,556	300,604	11,375,160	

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Line No	Program Element Number	Item	Act	FY 2020 Base	FY 2020 OCO for Base Requirements	FY 2020 OCO for Direct War and Enduring Costs	FY 2020 Total OCO	FY 2020 Total (Base + OCO)	Sec
246	0305204A	Tactical Unmanned Aerial Vehicles	07	5,097		34,100	34,100	39,197	U
247	0305206A	Airborne Reconnaissance Systems	07	11,177		14,000	14,000	25,177	U
248	0305208A	Distributed Common Ground/Surface Systems	07	38,121				38,121	U
249	0305219A	MQ-1C Gray Eagle UAS	07						U
250	0305232A	RQ-11 UAV	07	3,218				3,218	U
251	0305233A	RQ-7 UAV	07	7,817				7,817	U
252	0307665A	Biometrics Enabled Intelligence	07	2,000		2,214	2,214	4,214	U
253	0708045A	End Item Industrial Preparedness Activities	07	59,848				59,848	U
254	1203142A	SATCOM Ground Environment (SPACE)	07	34,169				34,169	U
255	1208053A	Joint Tactical Ground System	07	10,275				10,275	U
9999	9999999999	Classified Programs		7,273				7,273	U
		Operational Systems Development		1,978,826		73,218	73,218	2,052,044	
Total Research, Development, Test & Eval, Army				12,192,771		204,124	204,124	12,396,895	

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	90.187	52.839	98.698	-	98.698	93.844	97.626	100.673	93.971	0.000	627.838
FE8: *Vehicle Protection Suite*	-	10.656	26.871	47.698	-	47.698	93.844	97.626	100.673	93.971	0.000	471.339
XU9: *Active Protection System*	-	79.531	25.968	51.000	-	51.000	0.000	0.000	0.000	0.000	0.000	156.499

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). Active Protection System effort will execute installation design refinement and required testing to meet urgent fielding of NDI APS on Abrams, Bradley and Stryker pending Army leadership approval. 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 Controller (MAC) 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	98.600	69.204	47.706	-	47.706
Current President's Budget	90.187	52.839	98.698	-	98.698
Total Adjustments	-8.413	-16.365	50.992	-	50.992
• Congressional General Reductions	-0.055	-0.065			
• Congressional Directed Reductions	-30.700	-16.300			
• Congressional Rescissions	-	-			
• Congressional Adds	25.000	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.658	-			
• Adjustments to Budget Years	-	-	50.992	-	50.992

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: XU9: *Active Protection System*		
Congressional Add: *Additional APS Funding*	25.000	-
Congressional Add Subtotals for Project: XU9	25.000	-
Congressional Add Totals for all Projects	25.000	-

Change Summary Explanation

FY 2020 increase of $50.992 supports the completion of engineering, logistics, and program management to mature the Abrams and Bradley APS integration kit design, build APS prototypes, and execute system performance and safety testing necessary to obtain an APS Urgent Materiel Release (UMR).

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	Project (Number/Name) FE8 / *Vehicle Protection Suite*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
FE8: *Vehicle Protection Suite*	-	10.656	26.871	47.698	-	47.698	93.844	97.626	100.673	93.971	0.000	471.339
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Survivability improvements are a new start for FY 2020.

A. Mission Description and Budget Item Justification

Survivability improvements are a new start for FY 2020.

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 Controller (MAC) 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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Modular Active protection system Controller (MAC) Framework Integration of Non-Developmental Items (NDI)	7.572	19.969	31.563	-	31.563
Description: (Title Change, previously Maturation and Characterization of MAPS Compliant/Non-developmental Items (NDI) Capabilities) Development effort to incorporate the MAC framework and Non-developmental technologies on to ground combat platforms. The development effort will include design development, prototype build, component and platform qualification testing and logistics products.					
FY 2019 Plans: Continued design effort, incorporating mature active, reactive and passive solutions into the Modular Active protection system Controller. Laser Warning Receiver will be the initial system integrated with MAC.					
FY 2020 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** FE8 / *Vehicle Protection Suite*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Integration of the Laser Warning Receiver (LWR) with the Modular Active protection system Controller (MAC) development effort, to include design development, prototype build, component and platform qualification testing and logistics products onto the Abrams, Bradley, AMPV, Stryker, and other identified combat vehicle platforms. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase is due to initiation of the LWR and MAC integration efforts on the Abrams, Bradley, AMPV, and Stryker platforms.					
Title: VPS - Trade Study and Analysis of Alternatives (AoA) ***Description:*** Initiation of the VPS Trade Study and Analysis of Alternatives (AoA) will identify technologies, active, reactive and passive protection solutions, to pursue in the next phase of the program (Tranche II). ***FY 2019 Plans:*** Prepare an Analysis of Alternatives (AoA) and execute trade study of both existing and developmental active, reactive, and passive protection solutions. The VPS Trade Study and 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease is due to the completion of the AoA effort.	-	2.291	-	-	-
Title: Vehicle Protection Suite Government Engineering and Program Management ***Description:*** Government program management support and program oversight. ***FY 2019 Plans:*** Continued government program management support (labor, travel, training, supplies, and equipment) to support VPS program planning, to include the oversight of MAC characterization. ***FY 2020 Base Plans:*** Continuing government program management support to support VPS program planning, to include the oversight of MAC characterization and development of MAC-compliant VPS survivability sets.	3.084	3.627	3.627	-	3.627
Title: Survivability Improvements ***Description:*** Funding for the design development of the platform integration, test and logistic products of active, reactive, and passive survivability improvements onto ground combat vehicle platforms.	-	-	12.508	-	12.508

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** FE8 / *Vehicle Protection Suite*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2020 Base Plans: New start: Qualification testing, and logistic products of developed armor tile upgrades on the Army Ground Combat Vehicles. Initiation of Tranche II technology integration and testing on to ground combat platforms identified via the VPS AoA/trade study or as they emerge from industry or government Science and Technology efforts. These potential Tranche II technologies include but are not limited to: counter improvised explosive devices technologies, soft and hard kill, top attack defense, radar system upgrades, and other emerging technologies. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase is due to initiation of armor tile upgrade effort for three ground combat vehicle platforms and initiation of the integration of the Tranche II technologies.					
Title: FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer	-	0.984	-	-	-
Accomplishments/Planned Programs Subtotals	10.656	26.871	47.698	-	47.698

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

In FY 2018, the VPS program will initiate characterization of the MAC compliant/NDI capabilities (hardware, software, interfaces, etc.) to inform the VPS Analysis of Alternative (AoA). The MAC compliant/NDI capabilities characterization efforts will be achieved through bailments, Cooperative Research and Development Agreements (CRADA), and Other Transactional Agreements (OTA) with industry partners. The VPS AoA, informed by the Trade Study, will assess the cost, maturity, complexity, performance, and physical properties of alternative survivability sets to determine the optimal application of VPS solutions onto the Army's ground platforms. The VPS Tranche II solutions will have a decision point in FY 2020 with contract awards for platform specific engineering efforts planned for the first quarter of FY 2020.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	Project (Number/Name) FE8 / *Vehicle Protection Suite*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Vehicle Protection Suite Program Management	MIPR	TACOM Warren, Michigan : Various	-	3.084	Oct 2017	3.627	Oct 2018	3.627	Oct 2019	-		3.627	28.196	38.534	-
		Subtotal	-	3.084		3.627		3.627		-		3.627	28.196	38.534	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MAC Framework Integration of Non-Developmental Items (NDI)	MIPR	Various TACOM Warren : Warren, MI	-	7.572	Nov 2017	19.969	Dec 2018	26.274	Nov 2019	-		26.274	0.000	53.815	-
Survivability Improvements	MIPR	Various TACOM Warren : Warren, MI	-	-		-		6.024	Nov 2019	-		6.024	0.000	6.024	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.984	Nov 2018	-		-		-	0.000	0.984	-
		Subtotal	-	7.572		20.953		32.298		-		32.298	0.000	60.823	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Vehicle Protection Suite Analysis of Alternatives (AoA)	MIPR	Various : TACOM Warren Michigan	-	-		2.291	Jan 2019	-		-		-	0.000	2.291	-
		Subtotal	-	-		2.291		-		-		-	0.000	2.291	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	Project (Number/Name) FE8 / *Vehicle Protection Suite*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Survivability Improvements	MIPR	Various TACOM Warren : Warren, MI	-	-		-		6.484	Jun 2020	-		6.484	0.000	6.484	-
MAC Framework Integration of Non-Developmental Items (NDI)	MIPR	Various TACOM Warren : Warren, MI	-	-		-		5.289	Jun 2020	-		5.289	0.000	5.289	-
		Subtotal	-	-		-		11.773		-		11.773	0.000	11.773	N/A

Remarks

N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	10.656		26.871		47.698		-		47.698	28.196	113.421	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** FE8 / *Vehicle Protection Suite*

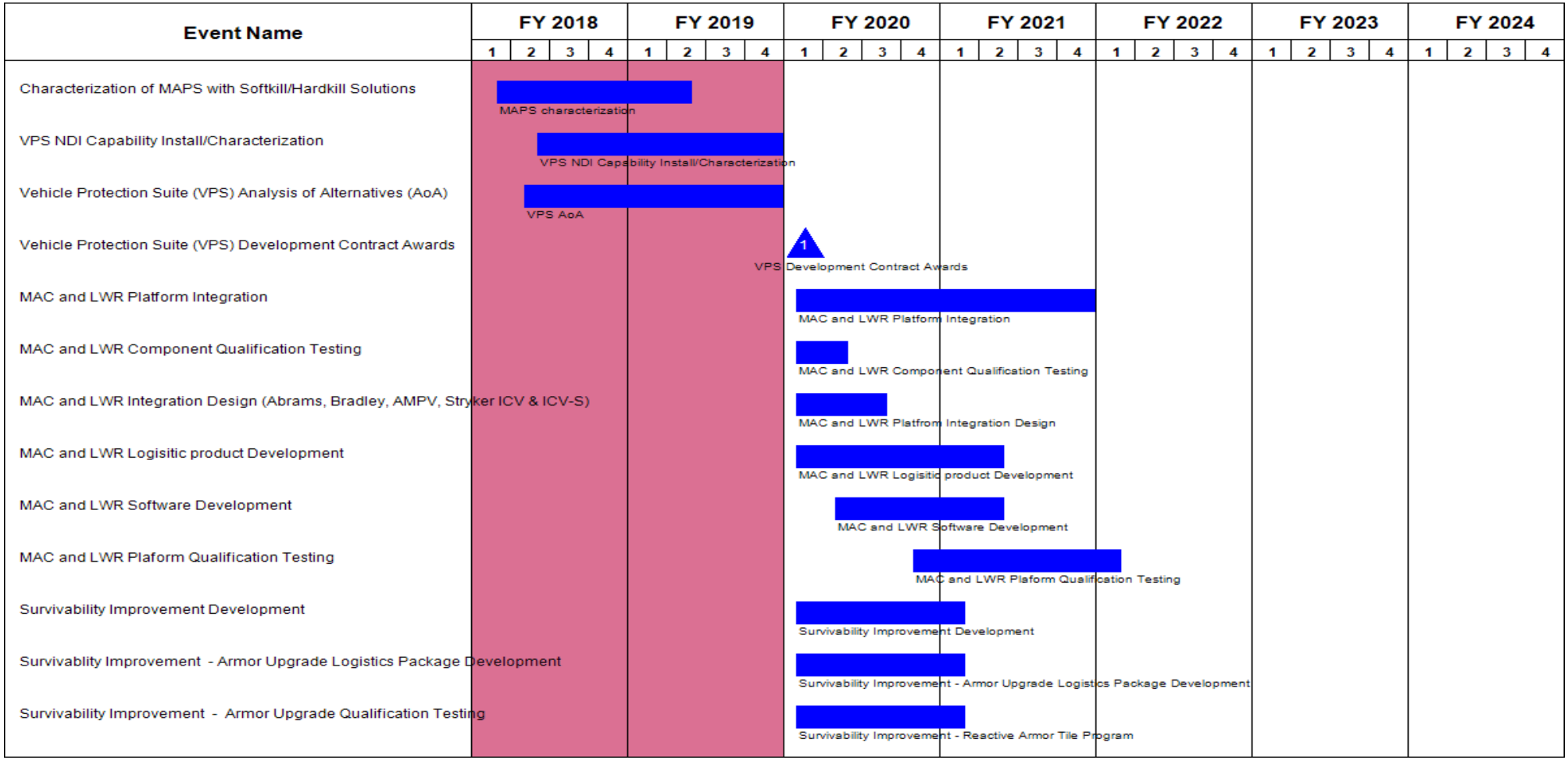

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** FE8 / *Vehicle Protection Suite*

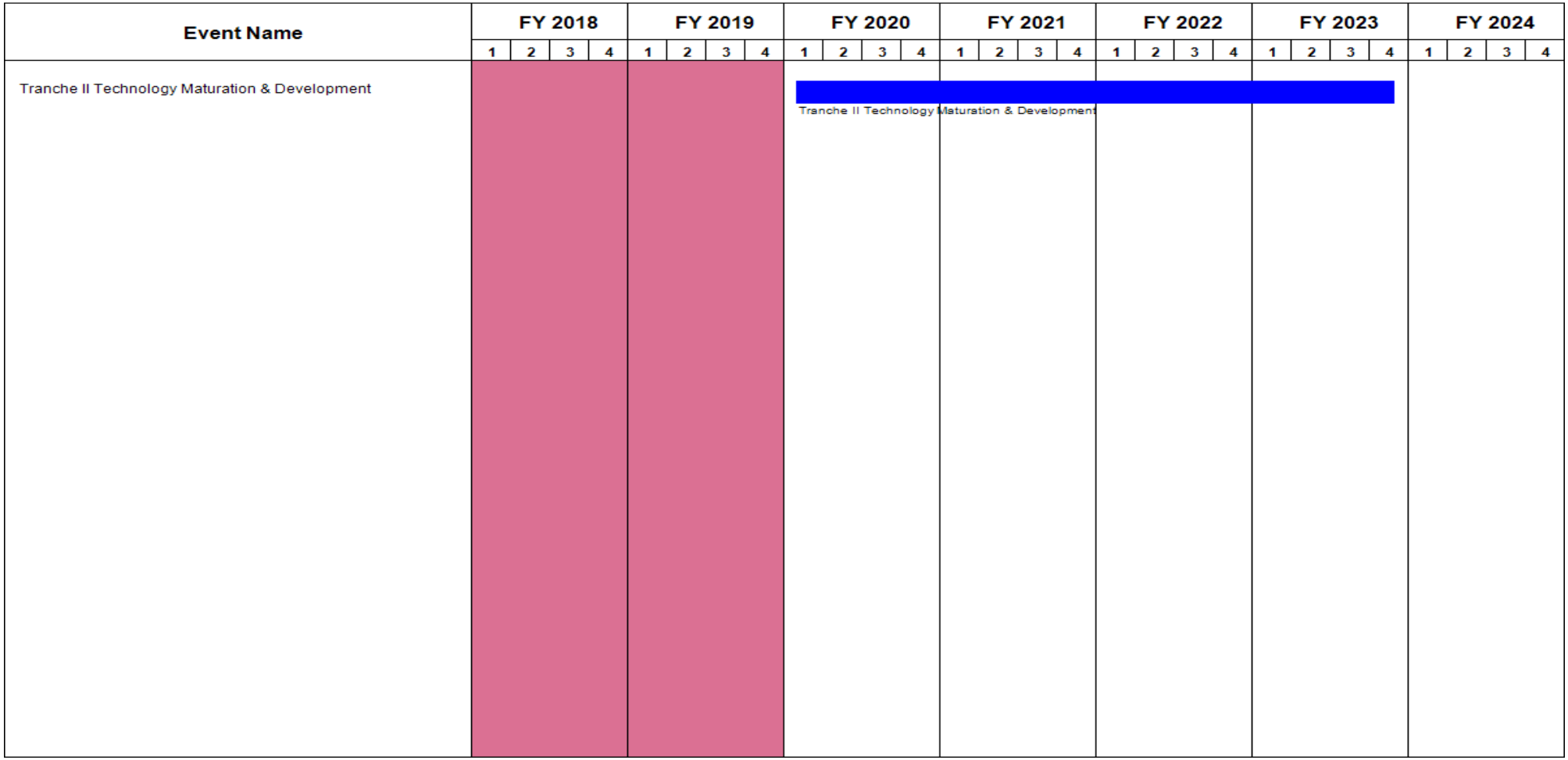

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** FE8 / *Vehicle Protection Suite*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Characterization of MAPS with Softkill/Hardkill Solutions	1	2018	2	2019
VPS NDI Capability Install/Characterization	2	2018	4	2019
Vehicle Protection Suite (VPS) Analysis of Alternatives (AoA)	2	2018	4	2019
Vehicle Protection Suite (VPS) Development Contract Awards	1	2020	1	2020
MAC and LWR Platform Integration	1	2020	4	2021
MAC and LWR Component Qualification Testing	1	2020	2	2020
MAC and LWR Integration Design (Abrams, Bradley, AMPV, Stryker ICV & ICV-S)	1	2020	3	2020
MAC and LWR Logisitic product Development	1	2020	2	2021
MAC and LWR Software Development	2	2020	2	2021
MAC and LWR Plaform Qualification Testing	4	2020	1	2022
Survivability Improvement Development	1	2020	1	2021
Survivablity Improvement - Armor Upgrade Logistics Package Development	1	2020	1	2021
Survivability Improvement - Armor Upgrade Qualification Testing	1	2020	1	2021
Tranche II Technology Maturation & Development	1	2020	4	2023

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	Project (Number/Name) XU9 / *Active Protection System*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
XU9: *Active Protection System*	-	79.531	25.968	51.000	-	51.000	0.000	0.000	0.000	0.000	0.000	156.499
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Active Protection System (APS) Installation Kit Refinement and System Test - Abrams ***Description:*** Funding provided supports APS Test Support for the M1A2 SEPv3 ***FY 2020 Base Plans:*** The Abrams APS effort will characterize and test the modified Abrams APS A-Kit with the existing B-Kit on an M1A2 SEPv3. Execute government, contractor and safety testing. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increase supports the completion of engineering, logistics, and program management to mature the Abrams APS integration kit design, build APS prototypes, and execute system performance and safety testing necessary to obtain an APS Urgent Materiel Release (UMR).	31.905	-	15.000	-	15.000
Title: Active Protection System (APS) Installation Kit Refinement and System Test - Bradley ***Description:*** Funding provided support APS integration and Test support for Bradley ***FY 2019 Plans:*** Continued engineering, logistics, and program management to mature the Bradley Active Protection System (APS) integration kit design, developed software releases across Bradley vehicle variants to operate the APS, and executed 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 2020 Base Plans:***	10.000	24.493	36.000	-	36.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** XU9 / *Active Protection System*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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 2019 to FY 2020 Increase/Decrease Statement:*** Increase supports the completion of engineering, logistics, and program management to mature the Bradley APS integration kit design, build APS prototypes, and execute system performance and safety testing necessary to obtain an APS Urgent Materiel Release (UMR).					
Title: Active Protection System (APS) Installation Kit Refinement and System Test - Stryker ***Description:*** Funding provided support APS integration and Test support for Stryker	12.626	-	-	-	-
Title: FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer	-	1.475	-	-	-
Accomplishments/Planned Programs Subtotals	54.531	25.968	51.000	-	51.000

	FY 2018	FY 2019
Congressional Add: Additional APS Funding ***FY 2018 Accomplishments:*** Additional APS Funding	25.000	-
Congressional Adds Subtotals	25.000	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• GA0700: *M1 Abrams Tank (MOD)*	602.026	959.041	348.800	13.100	361.900	399.314	369.166	386.422	370.544	Continuing	Continuing
• GZ2400: *Bradley Program (MOD)*	585.851	515.424	638.781	-	638.781	715.310	487.603	60.919	55.913	Continuing	Continuing
• GM0100: *Stryker (Mod)*	285.320	127.301	144.387	4.100	148.487	164.269	283.913	286.396	303.480	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** XU9 / *Active Protection System*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost

Remarks

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 has resulted in moving forward with installation design refinement and required testing to meet urgent fielding of NDI APS on Abrams, as well as Bradley and Stryker pending Army leadership approval.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	Project (Number/Name) XU9 / *Active Protection System*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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	-	14.152	Nov 2017	-		-		-		-	0.000	14.152	-
Active Protection System (APS) Installation Kit Development and Prototype Build - Bradley	SS/ Various	US Army TARDEC; Israeli Military Industries (IMI); BAE Systems : Warren, MI	-	0.039	Jan 2018	22.300	Jan 2019	30.300	Nov 2019	-		30.300	0.000	52.639	-
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	-	0.251	Jan 2018	-		-		-		-	0.000	0.251	-
Active Protection System (APS) Installation Kit Development and Prototype Build - 4th System	C/CPIF	Contract : Texas	-	25.000	Dec 2018	-		-		-		-	0.000	25.000	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		1.475	Nov 2018	-		-		-	0.000	1.475	-
		Subtotal	-	39.442		23.775		30.300		-		30.300	0.000	93.517	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Office (PMO) Support	MIPR	PEO Ground Combat Systems : Warren, MI	-	3.685	Oct 2017	0.600	Oct 2018	0.150	Oct 2019	-		0.150	0.000	4.435	-
		Subtotal	-	3.685		0.600		0.150		-		0.150	0.000	4.435	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	Project (Number/Name) XU9 / *Active Protection System*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Testing - Abrams Active Protection System (APS)	MIPR	Various : Army Test Centers	-	15.859	Nov 2017	-		15.000	Jan 2020	-		15.000	0.000	30.859	-
Government Testing - Bradley Active Protection System (APS)	MIPR	Various : Army Test Centers	-	9.261		1.593	Jan 2019	5.550	Jan 2020	-		5.550	0.000	16.404	-
Government Testing - Stryker Active Protection System (APS)	MIPR	Various : Army Test Centers	-	11.284	Jan 2018	-		-		-		-	0.000	11.284	-
		Subtotal	-	36.404		1.593		20.550		-		20.550	0.000	58.547	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	79.531		25.968		51.000		-		51.000	0.000	156.499	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** XU9 / *Active Protection System*

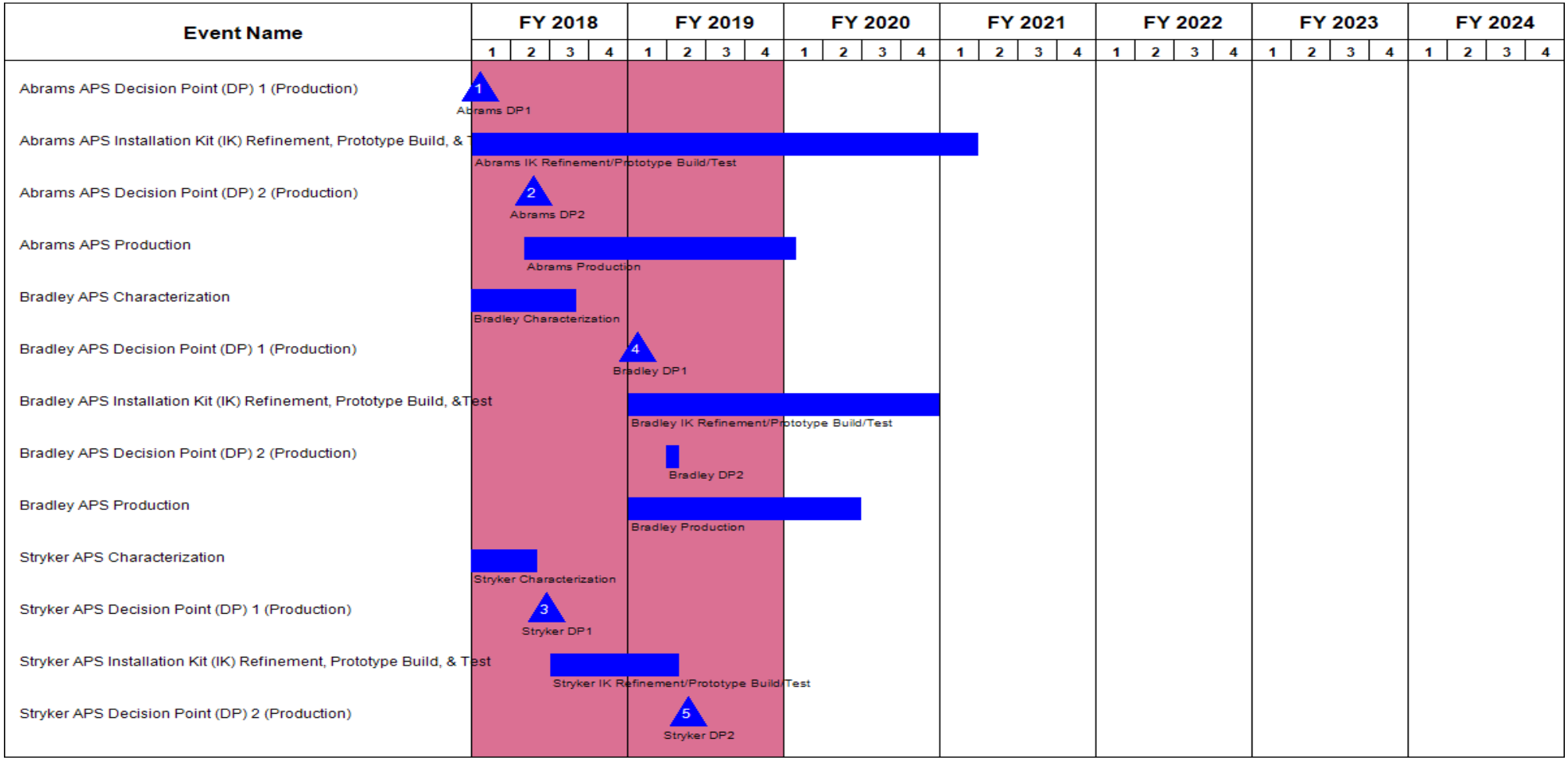

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** XU9 / *Active Protection System*

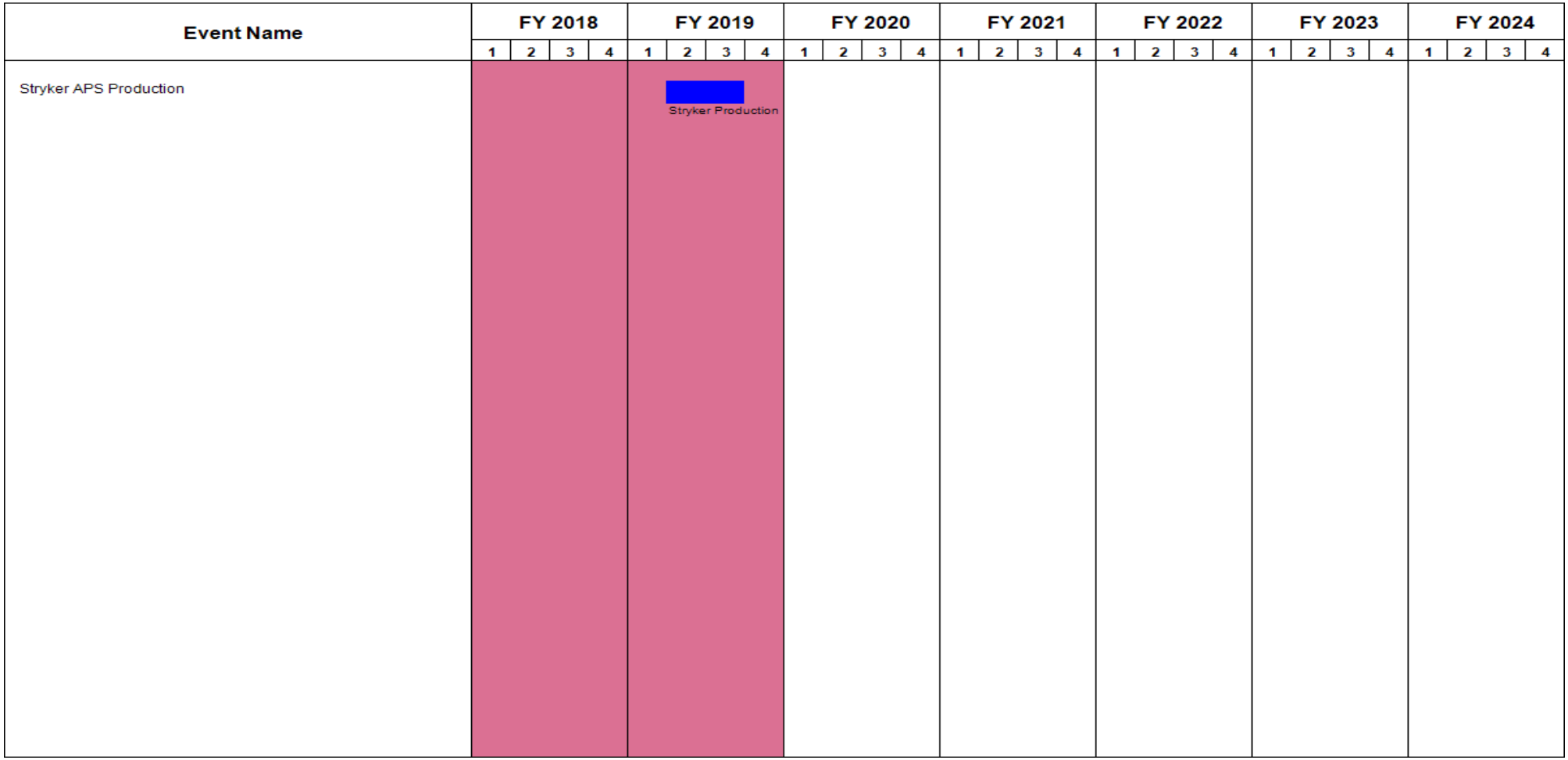

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604852A / *Suite of Survivability Enhancement Systems - EMD*	**Project (Number/Name)** XU9 / *Active Protection System*

Schedule Details

	Start		End	
Events	**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	2021
Abrams APS Decision Point (DP) 2 (Production)	2	2018	2	2018
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)	1	2019	1	2019
Bradley APS Installation Kit (IK) Refinement, Prototype Build, &Test	1	2019	4	2020
Bradley APS Decision Point (DP) 2 (Production)	2	2019	2	2019
Bradley APS Production	1	2019	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 Decision Point (DP) 2 (Production)	2	2019	2	2019
Stryker APS Production	2	2019	3	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604854A / *Artillery Systems - EMD*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	3.892	1.779	15.832	-	15.832	7.626	7.977	2.766	4.875	Continuing	Continuing
509: *LIGHTWEIGHT 155M HOWITZER*	-	3.892	1.779	7.632	-	7.632	7.626	7.977	2.766	4.875	0.000	36.547
HB6: *Mobile Howitzer*	-	0.000	0.000	8.200	-	8.200	0.000	0.000	0.000	0.000	Continuing	Continuing

Note

HB6 is a new start for FY2020.

A. Mission Description and Budget Item Justification

This program element encompasses engineering and manufacturing development for artillery weapons systems.

Project 509 supports the Lightweight 155mm Howitzer (LW155), also known as the M777A2, which is a Joint Service program between the US Marine Corps (USMC) and US Army which provides direct, reinforcing, general support fires to maneuver forces and direct support artillery. The LW155 was first introduced into the USMC in April 2005 and the Marines have fielded the howitzer to all active units. The Army 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 FY2014 and will continue through FY2018. The LW155 fires unassisted projectiles to a range of 30 kilometers (km) and assisted projectiles to 40km. It is a successful joint service program between the USMC and US Army working together to develop, produce, field, and sustain the howitzer. The howitzer will be going through obsolescent replacement of electronic components in its digital fire control system, since it has been in the field for more than ten years.

Current development efforts are focused on extending the range of the LW155 to reduce the threat of being out ranged by potential adversaries and meeting the range key performance parameter objective distance (greater than 40km) as stated in the Joint US Army, USMC Operational Requirements Document (JORD) for Advanced Towed Cannon System, but deferred during Engineering Manufacturing and Development due to technology maturity, cost and schedule. The USMC and US Army are leveraging technology being developed as part of the Extended Range Cannon Artillery (ERCA) program by the US Army. The ERCA program is a suite of technologies, cannon, ammunition and fire control, to increase the range of cannon artillery to exceed peer competitors range (greater than 70km). An operational assessment of the M777 Extended Range (M777ER) howitzer will be conducted at the end of FY2020 to assess the performance of best available projectiles and objective hardware of M777ER howitzer.

Project HB6 is a new start effort for FY2020 which supports the mobile howitzer program. The Mobile 155mm Howitzer is a Self-Propelled, 155mm Wheeled Howitzer that provides lethal, proactive counter-fire essential for the survivability of the maneuver formations and other close support fires as required. The Mobile Howitzer improves the Field Artillery Battalion's ability to maintain pace with its supporting maneuver formations and survive against responsive, counter-fire from near-peer threats with rapid displacement and emplacement times. The mobile howitzer will improve tactical mobility and system survivability compared to existing towed howitzer systems. Development efforts, prototyping and evaluations will focus on attributes such as improved emplacement and displacement times, driving speed, and crew protection capabilities, all without sacrificing lethality versus existing towed howitzer systems. Program activities in FY2020 will be focused on assessing current

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604854A *I Artillery Systems - EMD*

prototype mobile howitzers to increase maneuverability when engaging targets during emergency fire missions and increase Soldier survivability during counter-fire movements. Systems will be assessed in an operational environment.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	1.972	1.781	5.985	-	5.985
Current President's Budget	3.892	1.779	15.832	-	15.832
Total Adjustments	1.920	-0.002	9.847	-	9.847
• Congressional General Reductions	-0.002	-0.002			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	2.000	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.078	-			
• Adjustments to Budget Years	-	-	9.847	-	9.847

Change Summary Explanation

FY 2020 increase funds the operational assessment of the M777 Extended Range (M777ER) howitzer for the Army's modernization Long Range Precision Fires priority in support of the National Defense Strategy. Project HB6 is a new start in FY 2020 that focuses on evaluating mobile howitzers.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / *Artillery Systems - EMD*	Project (Number/Name) 509 / *LIGHTWEIGHT 155M HOWITZER*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
509: *LIGHTWEIGHT 155M HOWITZER*	-	3.892	1.779	7.632	-	7.632	7.626	7.977	2.766	4.875	0.000	36.547
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, is a Joint Service program between the US Marine Corps (USMC) and US Army which provides direct, reinforcing, general support fires to maneuver forces and direct support artillery. The LW155 was first introduced into the USMC in April 2005 and the Marines have fielded the howitzer to all active units. The Army 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 FY2014 and will continue through FY2018. The LW155 saw extensive action in Afghanistan, receiving high marks for its performance. It replaces all howitzers in all USMC missions 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 30 kilometers (km) and assisted projectiles to 40km. 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 40km 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. It is a successful joint service program between the USMC and US Army working together to develop, produce, field, and sustain the howitzer. The howitzer will be going through obsolescent replacement of electronic components in its digital fire control system, since it has been in the field for more than ten years.

Production and fielding of the LW155 concluded and entered into the Sustainment Life Cycle Phase. Current development efforts are focused on extending the range of the LW155 to reduce the threat of being out ranged by potential adversaries and meeting the range key performance parameter objective distance (greater than 40km) as stated in the Joint US Army, USMC Operational Requirements Document (JORD) for Advanced Towed Cannon System, but deferred during Engineering Manufacturing and Development due to technology maturity, cost and schedule. The USMC and US Army are leveraging technology being developed as part of the Extended Range Cannon Artillery (ERCA) program by the US Army. The ERCA program is a suite of technologies, cannon, ammunition and fire control, to increase the range of cannon artillery to exceed peer competitors range (greater than 70km). An operational assessment of the M777 Extended Range (M777ER) howitzer will be conducted at the end of FY2020 to assess the performance of best available projectiles and objective hardware of M777ER howitzer.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Management Services	0.204	0.204	-
Description: Funding supports management services within the Program Management Office, Towed Artillery Systems			
FY 2019 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604854A / *Artillery Systems - EMD*	**Project (Number/Name)** 509 / *LIGHTWEIGHT 155M HOWITZER*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease of $0.204M from FY19 to FY20 have been accounted for in the conversion of reimbursable to direct manpower.			
Title: Product Development ***Description:*** Funds engineering support from the Armaments Research Development and Engineering Center ***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 2020 Plans:*** Funding will support integration of enhanced structural components and recoil system components into the M777 Extended Range (M777ER) howitzer for the Operational Assessment. Also, funding will support Digital Fire Control System software update to include firing tables updates for new projectiles and corresponding NATO Ballistic Kernel integration. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase of $4.055M from FY19 to FY20 accounts for the updated prototype Digital Fire Control System software.	3.688	1.575	5.632
Title: Opertional Assessment ***Description:*** Funding will support operational assessment of M777 Extended Range Howitzer in a controlled test environment. ***FY 2020 Plans:*** Funding will support the Operational Assessment of the M777ER scheduled for 4th Quarter FY20. Operational Assessment will evaluate transportability and mobility of production-representative M777ER hardware and measure range of best available projectiles. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase of $2.000M from FY19 to FY20 accounts for the FY20 4th Quarter Operational Assessment of the M777ER howitzer.	-	-	2.000
Accomplishments/Planned Programs Subtotals	3.892	1.779	7.632

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604854A / *Artillery Systems - EMD*	**Project (Number/Name)** 509 / *LIGHTWEIGHT 155M HOWITZER*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• GZ1700: *M777 Mods*	28.672	3.086	2.367	-	2.367	10.995	16.223	17.238	20.260	Continuing	Continuing

Remarks

Procurement funding supports active retrofits and hardware refresh for previously contracted Digital Fire Control System components, addressing obsolescence. FY2021-2024 funding procures chrome cannon tubes to address spiral wear and durability issues.

D. Acquisition Strategy

Production and fielding of the M777A2 has concluded and has now entered into the Sustainment Life Cycle Phase. Current RDTE efforts are focused on extending the range of the M777A2 to reduce the threat of being out ranged by potential adversaries and meeting the range key performance parameter objective distance (>40KM) as stated in the Joint US Army, USMC Operational Requirements Document (JORD) for Advanced Towed Cannon System, but deferred during Engineering Manufacturing and Development due to technology maturity, cost and schedule. The USMC and US Army are leveraging technology being developed as part of the Extended Range Cannon Artillery (ERCA) program by the US Army. The ERCA program is a suite of technologies, cannon, ammunition and fire control, to increase the range of cannon artillery to exceed peer competitors range (>70KM). An operational assessment of the M777 Extended Range howitzer will be conducted at the end of FY20 to support the decision point for procurement in support of an Urgent Materiel Release.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / *Artillery Systems - EMD*	Project (Number/Name) 509 / *LIGHTWEIGHT 155M HOWITZER*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Sub Allot	Program Management Towed Artillery Systems : Picatinny Arsenal, NJ	0.590	0.204	Nov 2017	0.204	Nov 2018	-		-		-	Continuing	Continuing	Continuing
		Subtotal	0.590	0.204		0.204		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering	MIPR	Armaments Research & Developmet Center : Picatinny Arsenal, NJ	5.188	1.768	Nov 2017	1.575	Nov 2018	5.632	Nov 2019	-		5.632	Continuing	Continuing	Continuing
Long Lead Prototypes	MIPR	Watervliet Arsenal : Watervliet, NY	-	1.920	Jun 2018	-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	5.188	3.688		1.575		5.632		-		5.632	Continuing	Continuing	N/A

Remarks

FY 2020 increase funds the operational assessment of the M777 Extended Range (M777ER) howitzer for the Army's modernization Long Range Precision Fires.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Assessment	MIPR	Army Test & Evaluation Command : Yuma, AZ	-	-		-		2.000	Jul 2020	-		2.000	Continuing	Continuing	Continuing
		Subtotal	-	-		-		2.000		-		2.000	Continuing	Continuing	N/A

Remarks

FY2020 increase funds test center costs in support of the Operational Assessment at Yuma Test Center.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / *Artillery Systems - EMD*	Project (Number/Name) 509 / *LIGHTWEIGHT 155M HOWITZER*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	5.778	3.892		1.779		7.632		-		7.632	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604854A / *Artillery Systems - EMD*	**Project (Number/Name)** 509 / *LIGHTWEIGHT 155M HOWITZER*

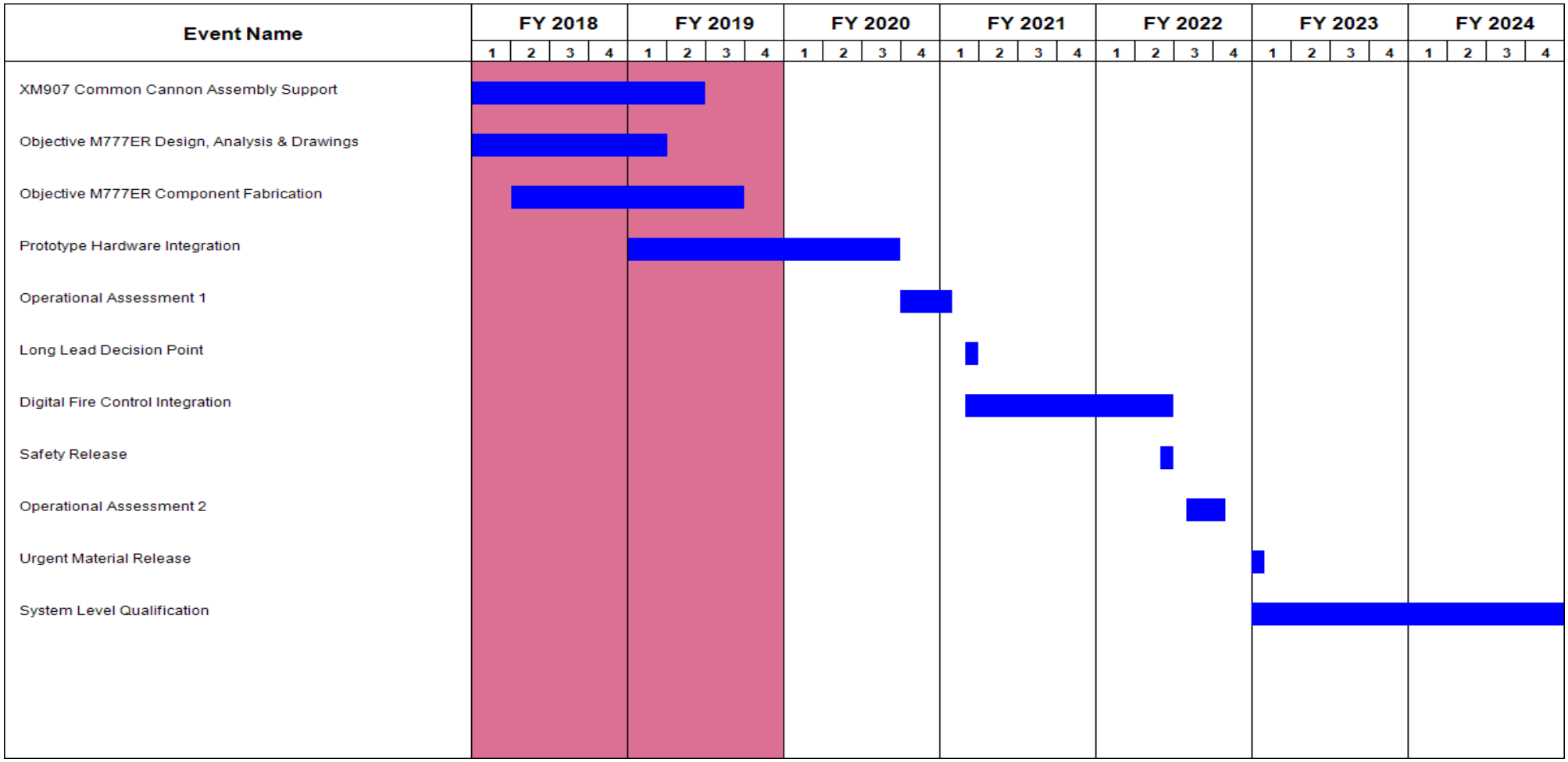

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604854A / *Artillery Systems - EMD*	**Project (Number/Name)** 509 / *LIGHTWEIGHT 155M HOWITZER*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
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
Prototype Hardware Integration	1	2019	3	2020
Operational Assessment 1	4	2020	1	2021
Long Lead Decision Point	1	2021	1	2021
Digital Fire Control Integration	1	2021	2	2022
Safety Release	2	2022	2	2022
Operational Assessment 2	3	2022	4	2022
Urgent Material Release	1	2023	1	2023
System Level Qualification	1	2023	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / *Artillery Systems - EMD*	Project (Number/Name) HB6 / *Mobile Howitzer*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
HB6: *Mobile Howitzer*	-	0.000	0.000	8.200	-	8.200	0.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Project is a New Start for FY 2020.

A. Mission Description and Budget Item Justification

Project HB6 is a new start effort for FY2020 which supports the mobile howitzer program. The Mobile 155mm Howitzer is a Self-Propelled, 155mm Wheeled Howitzer that provides lethal, proactive counter-fire essential for the survivability of the maneuver formations and other close support fires as required. The Mobile Howitzer improves the Field Artillery Battalion's ability to maintain pace with its supporting maneuver formations and survive against responsive, counter-fire from near-peer threats with rapid displacement and emplacement times. The mobile howitzer will improve tactical mobility and system survivability compared to existing towed howitzer systems. Development efforts, prototyping and evaluations will focus on attributes such as improved emplacement and displacement times, driving speed, and crew protection capabilities, all without sacrificing lethality versus existing towed howitzer systems. Program activities in FY2020 will be focused on assessing current prototype mobile howitzers to increase maneuverability when engaging targets during emergency fire missions and increase Soldier survivability during counter-fire movements. Systems will be assessed in an operational environment.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Mobile Howitzer Analysis ***Description:*** Conducts analysis of prototype and existing mobile howitzers. ***FY 2020 Plans:*** Funding will conduct analysis of prototype and existing mobile howitzers and evaluate systems based on mobility and survivability attributes. Suitable systems will be further assessed in an operational environment. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Project is a new start for FY 2020.	-	-	3.100
Title: Safety Testing ***FY 2020 Plans:*** Funding will support safety testing of mobile howitzer systems and prototypes to ensure they will be viable for assessment in an operational environment. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Project is a new start for FY 2020.	-	-	4.100
Title: Operational Assessment	-	-	1.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604854A / *Artillery Systems - EMD*	**Project (Number/Name)** HB6 / *Mobile Howitzer*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Funding will support the Operational Assessment of the prototype mobile howitzers. ***FY 2020 Plans:*** Funding will support the Operational Assessment of the prototype mobile howitzers scheduled for 4th Quarter FY20. Operational Assessment will evaluate survivability, mobility, and lethality of prototype mobile howitzers. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Project is a new start for FY 2020.			
Accomplishments/Planned Programs Subtotals	-	-	8.200

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The acquisition strategy for the Mobile Howitzer Program is to evaluate existing industry prototypes and fielded systems and assess capability of mobility and survivability attributes. Evaluation will be conducted by US Army engineers and the Army Test and Evaluation Command.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0604854A / *Artillery Systems - EMD*	Project (Number/Name) HB6 / *Mobile Howitzer*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mobile Howitzer Analysis	MIPR	Armament Research, Development & Enigneering Center : Picatinny Arsenal, NJ	-	-		-		3.100	Oct 2019	-		3.100	Continuing	Continuing	-
		Subtotal	-	-		-		3.100		-		3.100	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Safety Test	MIPR	Yuma Test Center : Yuma, AZ	-	-		-		4.100	Jun 2020	-		4.100	Continuing	Continuing	-
Opertaional Assessment	MIPR	Yuma Test Center : Yuma, AZ	-	-		-		1.000	Aug 2020	-		1.000	Continuing	Continuing	-
		Subtotal	-	-		-		5.100		-		5.100	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		8.200		-		8.200	Continuing	Continuing	N/A

Remarks

Project is a New Start for FY2020.

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604854A / *Artillery Systems - EMD*	**Project (Number/Name)** HB6 / *Mobile Howitzer*

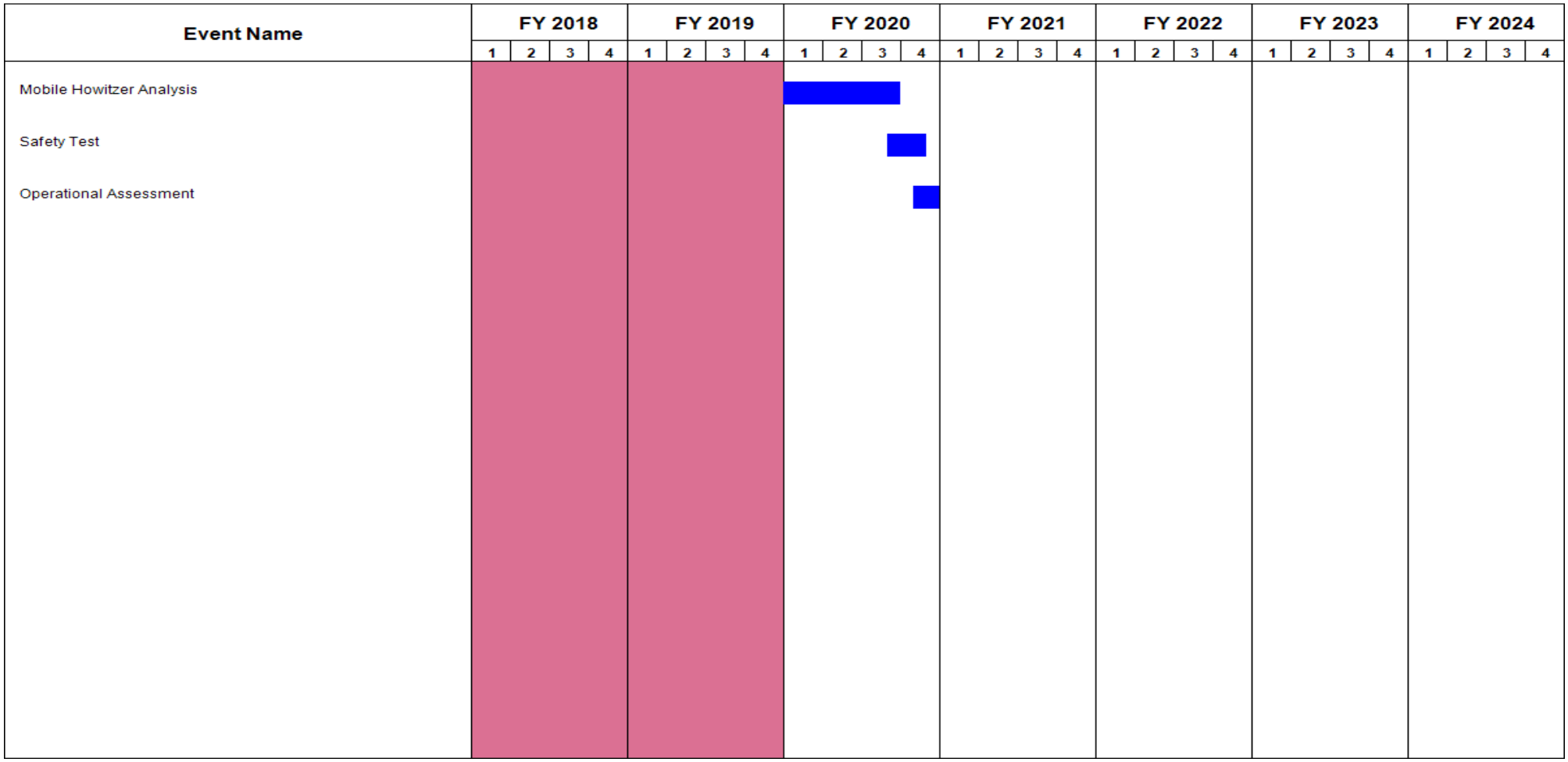

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0604854A / *Artillery Systems - EMD*	**Project (Number/Name)** HB6 / *Mobile Howitzer*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Mobile Howitzer Analysis	1	2020	3	2020
Safety Test	3	2020	4	2020
Operational Assessment	4	2020	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army												Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	62.613	77.686	126.537	-	126.537	150.493	134.912	60.451	30.429	0.000	643.121
099: *Army Human Resource System*	-	12.845	1.503	2.477	-	2.477	0.839	0.316	0.210	0.210	0.000	18.400
184: *Installation Support Modules*	-	1.460	1.627	1.503	-	1.503	1.411	1.278	1.295	1.308	0.000	9.882
193: *Medical Communications For Combat Casualty*	-	0.375	2.884	0.056	-	0.056	0.008	0.000	0.000	0.000	0.000	3.323
738: *AcqBiz*	-	2.973	24.002	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	26.975
FE9: *ALTESS (P&R Forms)*	-	0.105	0.112	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.217
FL9: *Army Accessioning IT Development*	-	0.000	0.000	43.432	-	43.432	43.647	26.262	8.307	6.952	0.000	128.600
FM7: *Human Resouces Information Technology*	-	0.000	0.000	9.932	-	9.932	13.896	13.677	13.718	7.784	0.000	59.007
FM8: *Information Technology for Training Systems*	-	0.000	0.000	40.720	-	40.720	35.290	34.270	24.958	4.611	0.000	139.849
FM9: *Information Technology for Criminal Investigations*	-	0.000	0.000	1.245	-	1.245	1.237	1.242	1.245	1.247	0.000	6.216
T04: *USMEPCOM TRANSFORMTION - IT MODERNIZATION*	-	7.045	17.802	16.624	-	16.624	10.982	11.383	2.235	0.000	0.000	66.071
T05: *Army Business System Modernization Initiatives*	-	34.355	27.790	5.974	-	5.974	38.516	41.723	3.677	3.415	0.000	155.450
VR3: *ASMIS-R (REPORTIT)*	-	3.455	1.966	3.095	-	3.095	3.159	3.222	3.268	3.301	0.000	21.466
XV6: *Army Leader Dashboard*	-	0.000	0.000	1.479	-	1.479	1.508	1.539	1.538	1.601	0.000	7.665

Note

The following project realignments have been completed to increase transparency within this Program Element:
- Army Safety Management Information System - Revised (ASMIS-R) funding was realigned from project T05 to project VR3 in FY 2018
- ALTESS (P&R Forms) funding was realigned from project 738 to project FE9 in FY 2018

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605013A *I Information Technology Development*

- Army Accessions Information Environment (AIE) and Human Resource Command (HRC) IT development was realigned from project T05 to project FL9 in FY 2020
- Army Human Resources IT development efforts were realigned from project T05 to project FM7 in FY 2020
- Army Training IT development efforts were realigned from project T05 to project FM8 in FY 2020
- Army Criminal Investigation IT development efforts were realigned from project T05 to project FM9 in FY 2020

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.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	81.776	113.758	100.831	-	100.831
Current President's Budget	62.613	77.686	126.537	-	126.537
Total Adjustments	-19.163	-36.072	25.706	-	25.706
• Congressional General Reductions	-0.058	-0.072			
• Congressional Directed Reductions	-10.493	-36.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-5.843	-			
• SBIR/STTR Transfer	-2.769	-			
• Adjustments to Budget Years	-	-	25.706	-	25.706

Change Summary Explanation

FY 2020 increase of $25.362 million is attributable to increased development for the Army Training Information System (ATIS), as well as smaller increases among the other projects, to include inflation.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*				Project (Number/Name) 099 / *Army Human Resource System*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
099: *Army Human Resource System*	-	12.845	1.503	2.477	-	2.477	0.839	0.316	0.210	0.210	0.000	18.400
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Line of Effort 2: Common Operating Environment
This LOE provides solutions for current issues with stove-piped mission command systems that function well individually, but do not integrate easily with each other nor does it provide an accurate common operating picture. 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 GoArmyEd, Commander's Risk Reduction Dashboard, Deployed Theater Accountability System, Range Facility Maintenance Support System, and the electronic Military Personnel System.

A. Mission Description and Budget Item Justification

Line of Effort 2: Common Operating Environment
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. It is used by authorized customers 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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 099 / *Army Human Resource System*

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 provides Commanders at echelons Company through Major Army Command the ability to visualize and take preventive action to mitigate risk factors impacting their soldiers and formations by going to one dashboard and seeing data from multiple data sources.

The United States Army Reserve (USAR) utilizes the Regional Level Application Software (RLAS) as an enterprise system for duty attendance, military pay, Soldier records management and training calendar management to access, transact, store and manage Soldier and unit data required to conduct synchronized USAR operations. Unlike the Army Active Component (AC) where Soldier military pay is centrally managed and input at the installation level, the USAR utilizes RLAS to manage and input decentralized Soldier pay transactions at the unit level. RLAS consists of four modules: Pay, Personnel, Training, and Resource Management. Research and Development (R&D) authority and funding will provide RLAS with investment funds for necessary system development and system modifications. R&D funding amounts increase slightly towards the end of RLAS lifecycle (FY 2019 and 2020) in order to fully support the Integrated Pay and Personnel System - Army (IPPS-A) transition. Annually, USAR will provide sustainment funding. R&D authority and sustainment funding will meet the USAR Staff Judge Advocate (SJA) and Office of the Secretary of Defense Judge Advocate General (OTJAG) opinions regarding defense information Technology (IT) system for R&D activities. Necessary RLAS system development and system modifications include: 1) IPPS-A interface requirements; 2) implementing Microsoft .net Framework 4.5 standards; 3) implementing new Operating Systems (OS), system utilities and other technology products. Enhanced development and modification to RLAS will improve RLAS system capabilities and bring RLAS into compliance with various Army Cyber Command (ARCYBER) and audit readiness requirements. RLAS will continue to process duty attendance, military pay, Soldier personnel transactions and training calendars until the system is fully subsumed by IPPS-A.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Commanders Risk Reduction Dashboard (CRRD)	3.154	0.100	1.567	-	1.567
Description: CRRD is a capability that enable Commanders in the U.S. Army to identify, act upon, monitor, track, and manage soldier-level and unit-level risk. CRRD will consolidate information from multiple Army databases and present to commanders a concise dashboard visualizing which Soldiers and units within their command are impacted by a variety of risk factors. ***FY 2019 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 2020 Base Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 099 / *Army Human Resource System*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
In FY 2020 the CRRD tool will develop additional interfaces as required by Commanders as they become more familiar with the system's capability, and refinement of existing capability based upon Commander feedback. The funding also enables interface and capability development for Executive Officers, First Sergeants, and Command Sergeants Major as authorization to use the CRRD capability grows to include those user groups (currently under policy review). Funding will also enable refinement of predictive analytics and the ability to generate and print additional reports based on Commander feedback. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The FY 2020 increase is required to enable enhancement of existing capability as Commander?s become more familiar with the CRRD and to enable interfaces with additional data sources requested by Commanders. Additionally, the FY 2020 CRRD funding enables development of capability for Executive Officers, First Sergeants, and Command Sergeants Major as CRRD becomes available for those users (Currently under policy review).					
Title: GoArmyEd Modernization	9.691	0.772	0.250	-	0.250
Description: GoArmyEd Modernization - 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. Funding will support continued modernization/automation of GoArmyEd functionality and provide Data Center at HRC. ***FY 2019 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 2020 Base Plans:*** Finalize all contingency operations. Modern GoArmyEd goes live, current GoArmyEd deactivated. ***FY 2019 to FY 2020 Increase/Decrease Statement:***					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 099 / *Army Human Resource System*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Project is near scheduled completion.					
Title: Regional Level Application Software (RLAS) ***Description:*** The United States Army Reserve (USAR) utilizes the Regional Level Application Software (RLAS) as an enterprise system for duty attendance, military pay, Soldier records management and training calendar management to access, transact, store and manage Soldier and unit data required to conduct synchronized USAR operations. Unlike the Army Active Component (AC) where Soldier military pay is centrally managed and input at the installation level, the USAR utilizes RLAS to manage and input decentralized Soldier pay transactions at the unit level. RLAS consists of four modules: Pay, Personnel, Training, and Resource Management. R&D authority and funding will meet the USAR Staff Judge Advocate (SJA) and Office of the Secretary of Defense Judge Advocate General (OTJAG) opinions regarding defense information Technology (IT) system for R&D activities. Necessary RLAS system development and system modifications include: 1) Integrated Pay and Personnel System ? Army (IPPS-A) interface requirements; 2) implementing Microsoft .net Framework 4.5 standards; 3) implementing new Operating Systems (OS), system utilities and other technology products. Enhanced development and modification will improve RLAS system capabilities and bring RLAS into compliance with various Army Cyber Command (ARCYBER) and audit readiness requirements. ***FY 2019 Plans:*** Conducted system analysis to determine best Course of Action (COA) for the remediation of Active X and removal of Active X from all RLAS servers, components and client side installs. A COA was selected and work has begun on Active X remediation. ***FY 2020 Base Plans:*** Leverage virtual platform environment -move RLAS into the Army.mil highest level Active Directory Domain allowing RLAS to be accessed by users worldwide - removing RLAS from the USAR ARNET AD Enclave (remove domain). Leverage .Net architecture to improve RLAS system performance and user experience for faster load times. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Continued development of the system data interface for IPPS-A Soldier Admin Data.	-	0.552	0.660	-	0.660
Title: FY 2019 SBIR / STTR Transfer ***Description:*** FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:***	-	0.079	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 SBIR / STTR Transfer					
FY 2019 to FY 2020 Increase/Decrease Statement: FY 2019 SBIR / STTR Transfer					
Accomplishments/Planned Programs Subtotals	12.845	1.503	2.477	-	2.477

C. Other Program Funding Summary ($ in Millions)

N/A

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.

CRRD - The use of Agile development within 3 Acquisition Increments to allow for a shift to rapid continuous updates across the areas of Data, Features, Users, and Technology. CRRD uses an agile development framework incorporating User Experience Exercises (UXE) to expedite capability to the field while maintaining Acquisition control through Limited Deployment Authorities to Proceed and a competitively awarded sustainment contract. CRRD plans for eventual incorporation into IPPS-A.

RLAS - Will utilize GSA contract support to solicit FY 2020/2021 two-year software support & development contract - hybrid Firm Fixed Price & Time and Materials. RLAS will utilize GSA contract support to solicit FY 2021/2022/2023 three-year software support & development contract - hybrid Firm Fixed Price & Time and materials. RLAS will utilize existing USAR G6 hardware / servers / virtual environment / Active Directory / level 1-2 help desk / utility software / OS / DB / and other necessary hardware and devices as needed to operate the RLAS system.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) 099 / *Army Human Resource System*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	C/FFP	Acquisition Contract Center : Rock Island, Il	1.519	-		-		-		-		-	0.000	1.519	-
GoArmyEd Modernization	TBD	IBM : Various	-	0.591		-		-		-		-	0.000	0.591	-
		Subtotal	1.519	0.591		-		-		-		-	0.000	2.110	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AHRS - ECPs/SCPs/ICPs/ RLAS	C/FFP	Hewlitt Packard : various	89.251	-		0.552		0.660		-		0.660	0.000	90.463	-
AHRS - Software Development	C/FFP	Hewlitt Packard : various	51.723	-		-		-		-		-	0.000	51.723	-
GoArmyEd Modernization	C/FFP	IBM : Various	7.752	9.100		0.772		0.250		-		0.250	0.000	17.874	-
CRRD	C/FFP	PEO EIS : FT Belvoir VA	5.306	3.154		0.100		1.567		-		1.567	0.000	10.127	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.079		-		-		-	0.000	0.079	-
		Subtotal	154.032	12.254		1.503		2.477		-		2.477	0.000	170.266	N/A

Remarks

CRRD is developed Government to Government by the Army Analytics and Visualization Lab at Redstone Arsenal via competitively awarded development contracts.

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	155.551	12.845		1.503		2.477		-		2.477	0.000	172.376	N/A

Remarks

GoArmyEd (GAE) has no additional changes from FY19-20

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 099 / *Army Human Resource System*

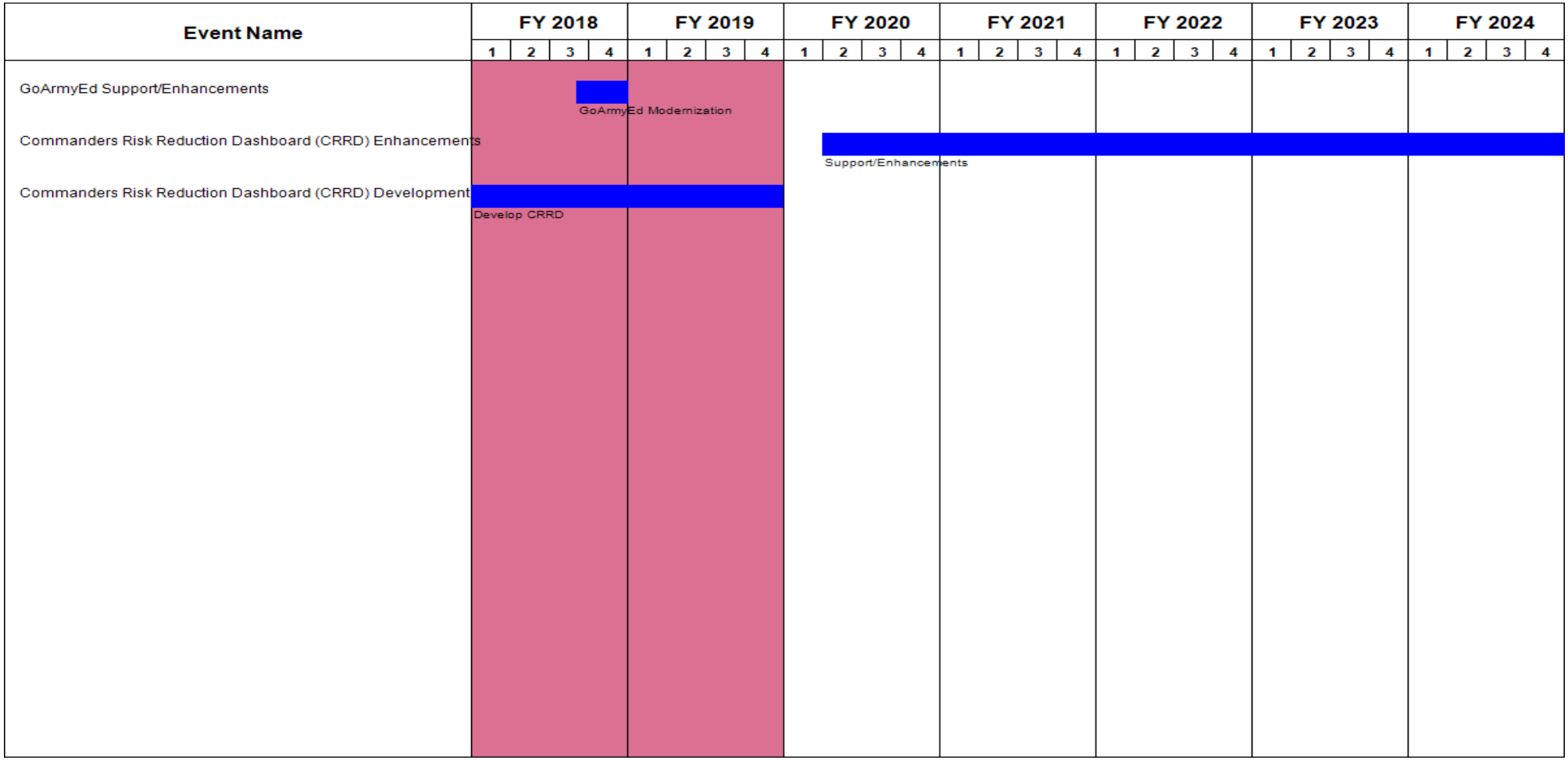

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 099 / *Army Human Resource System*

Schedule Details

	Start		End	
Events	**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	3	2018	4	2018
Commanders Risk Reduction Dashboard (CRRD) Enhancements	2	2020	4	2025
Commanders Risk Reduction Dashboard (CRRD) Development	3	2015	4	2019

Note

GoArmyEd (GAE) has no additional changes from FY19-20

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) 184 / *Installation Support Modules*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
184: *Installation Support Modules*	-	1.460	1.627	1.503	-	1.503	1.411	1.278	1.295	1.308	0.000	9.882
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.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Army Behavioral Health Integrated Data Environment	1.460	1.547	1.503	-	1.503
Description: Army Behavioral Health Integrated Data Environment (ABHIDE) will be the U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM) Suicide Registry.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 184 / *Installation Support Modules*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2019 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. ***FY 2020 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program near the end of development.					
Title: FY 2019 SBIR / STTR Transfer ***Description:*** FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer	-	0.080	-	-	-
Accomplishments/Planned Programs Subtotals	1.460	1.627	1.503	-	1.503

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 184 / *Installation Support Modules*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• BE4162: *MACOM AUTOMATION SYSTEMS*	48.219	132.328	57.861	23.000	80.861	33.994	66.187	54.690	62.138	Continuing	Continuing

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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) 184 / *Installation Support Modules*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Army Behavioral Health Integrated Data Environment	C/FFP	various : various	6.786	1.460		1.547		1.503		-		1.503	Continuing	Continuing	-
Post-Deployment Solfware 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	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.080		-		-		-	0.000	0.080	-
		Subtotal	12.938	1.460		1.627		1.503		-		1.503	Continuing	Continuing	N/A

Remarks

Post Deployment Software Support (PDSS) continues through FY 2025 as the Central issue Facility module evolves with changes in OCIE requirements.

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	15.049	1.460		1.627		1.503		-		1.503	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 184 / *Installation Support Modules*

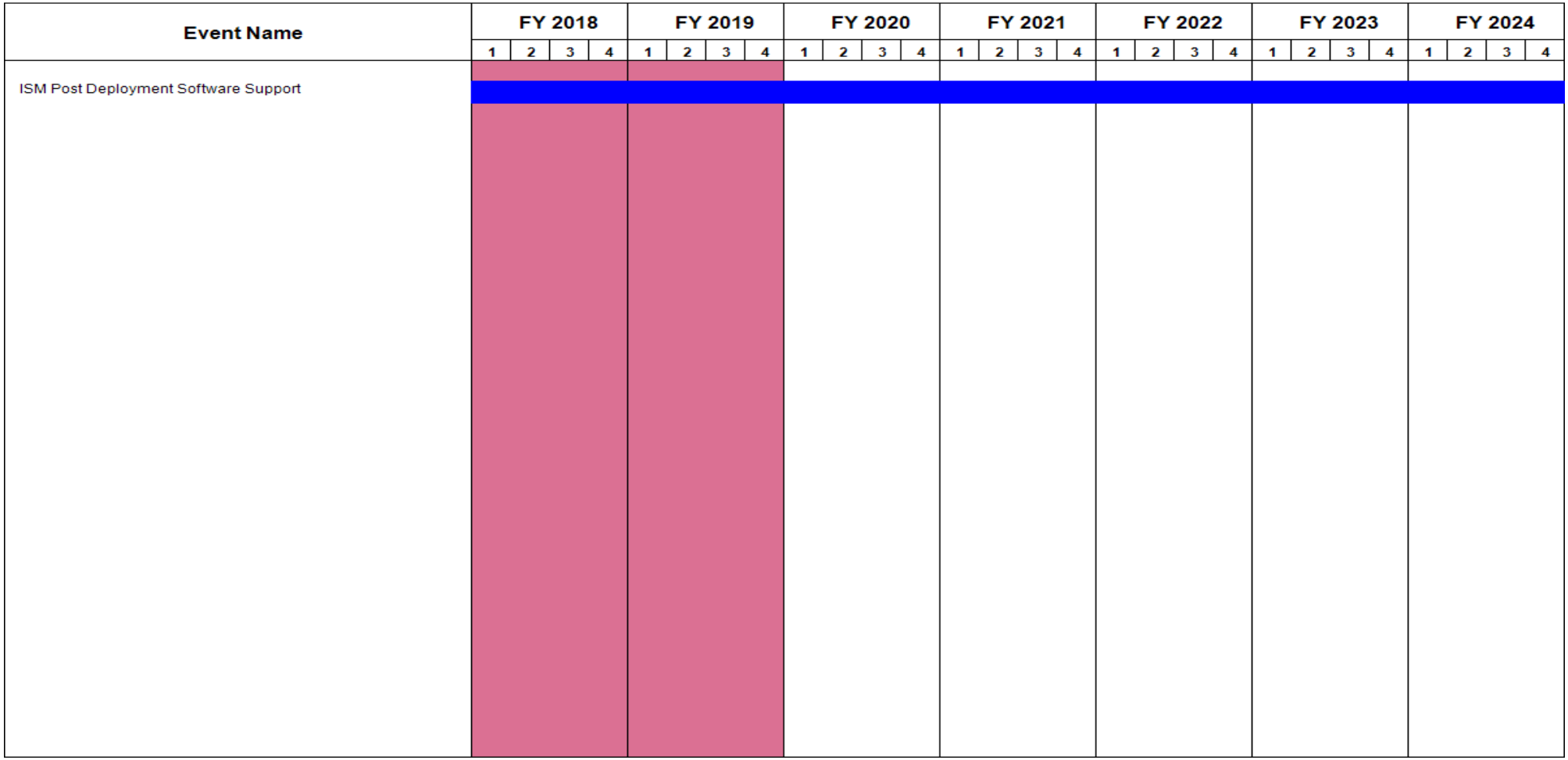

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 184 / *Installation Support Modules*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ISM Post Deployment Software Support	4	2003	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) 193 / *Medical Communications For Combat Casualty*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
193: *Medical Communications For Combat Casualty*	-	0.375	2.884	0.056	-	0.056	0.008	0.000	0.000	0.000	0.000	3.323
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 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 2020 Base funding in the amount of $0.056 million will be used for the engineering effort required to evaluate initiatives that improve the performance of the Defense Healthcare Management Systems (DHMS) Electronic Health Record software on the Army platform, as well as the engineering effort for other Army unique capabilities. Activities include:
--Monitor research and development activities with Research partners (United States Army Medical Research and Materiel Command, and United States Army Communications-Electronics Research, Development and Engineering Center) to identify emerging technologies for potential insertion into the electronic health record system.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Engineering and Technical Support	0.370	1.512	0.056	-	0.056
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 Readiness Levels (TRL) 6 or beyond, and engineering effort to modify system parameters due to cybersecurity or other pressing need.					
FY 2019 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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. ***FY 2020 Base Plans:*** Monitor emerging technologies for potential incremental integration into system baseline. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease of funding from FY 2019 to FY 2020 resulted from other Government agencies assuming responsibility for research and development activities in support of program objectives.					
Title: PMO Testing Support ***Description:*** Test augmentation by outside agencies to include test efforts for DHMS/TMIP-J and other Army unique software capabilities. ***FY 2019 Plans:*** Test augmentation by outside agencies to support pilot testing of new point of injury hardware device prior to procurement and deployment. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Testing expected to be completed in FY 2019 for objective system, no outside testing support anticipated for FY 2020.	-	0.200	-	-	-
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 2019 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 2019 to FY 2020 Increase/Decrease Statement:***	0.005	1.031	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 193 / *Medical Communications For Combat Casualty*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Testing expected to be completed in FY 2019, no additional testing anticipated in FY 2020.					
Title: FY 2019 SBIR / STTR Transfer	-	0.141	-	-	-
Description: FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer					
Accomplishments/Planned Programs Subtotals	0.375	2.884	0.056	-	0.056

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• MA8000: *Family of Med Comm for Combat Casualty Care*	15.964	22.226	16.590	1.231	17.821	19.563	11.831	7.480	5.251	0.000	100.136

Remarks

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

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army		Date: March 2019
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.141		-		-		-	0.000	0.141	-
		Subtotal	-	-		0.141		-		-		-	0.000	0.141	N/A

Remarks

MC4 is a COTS (Commercial-Off-the-Shelf) hardware, GFE (Government Furnished Equipment) software system. MC4 provides the integration of the hardware and software and also fields to and supports the system to Army units. No product development is performed. Hardware is bought commercially off the shelf through commercial contracts and software is developed and provided by the Defense Health Medical Systems Joint Operational Medical Information Systems (DHMS/JOMIS).

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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 (formerly L-3) : Various	6.218	0.370	Jan 2018	2.543	Jan 2019	0.056	Jan 2020	-		0.056	0.000	9.187	-
Information Assurance	Various	ISEC Support : AZ	1.783	-		-		-		-		-	0.000	1.783	-
		Subtotal	17.391	0.370		2.543		0.056		-		0.056	0.000	20.360	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO Testing Spt	MIPR	ATEC/AMEDD Board/JITC : various	6.756	0.005		0.200		-		-		-	0.000	6.961	-
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	50.408	0.005		0.200		-		-		-	0.000	50.613	N/A

Remarks

PMO Testing Support is provided by other Government agencies (AMEDD Board, ATEC and others).

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	76.204	0.375		2.884		0.056		-		0.056	0.000	79.519	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 193 / *Medical Communications For Combat Casualty*

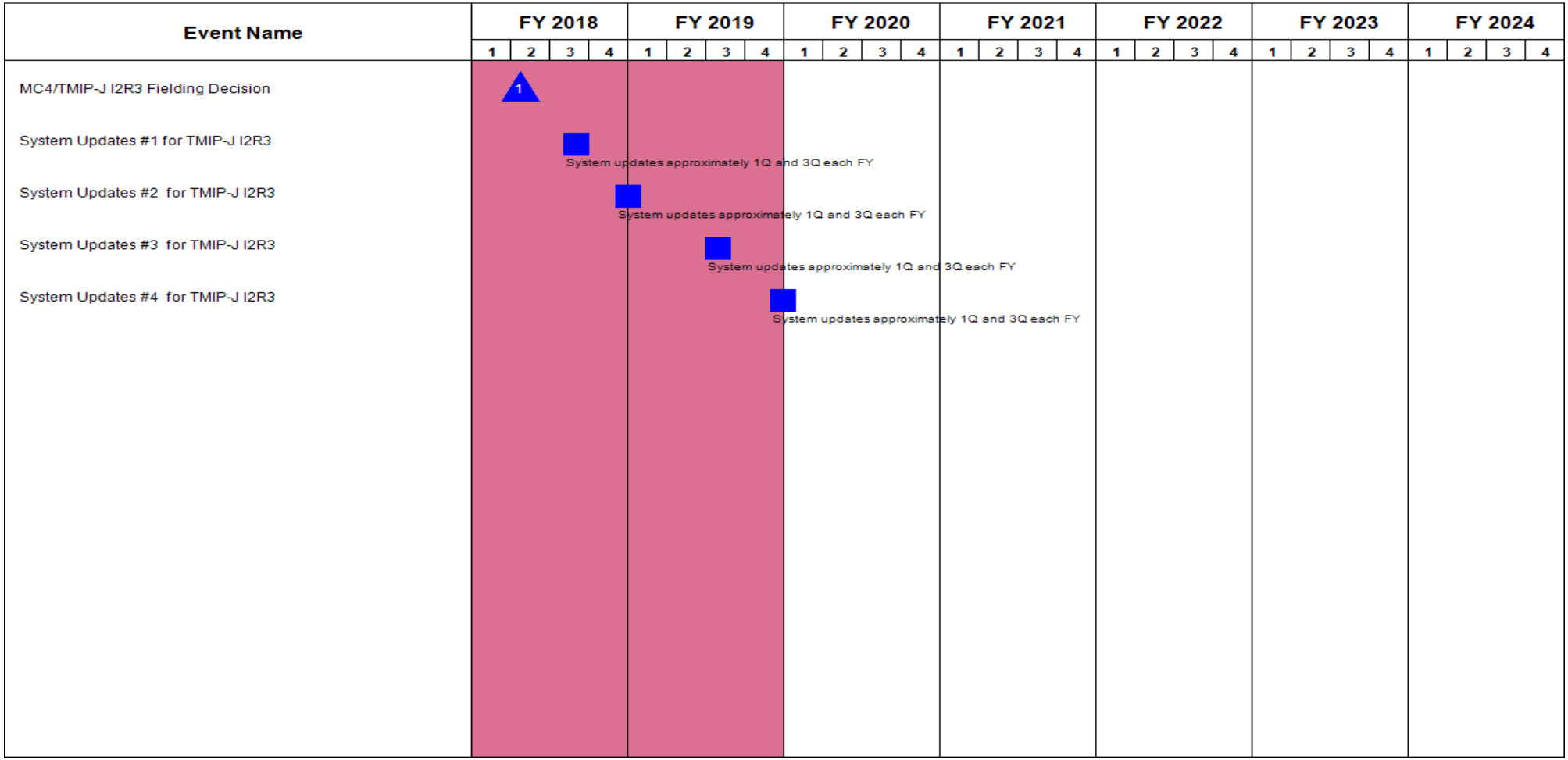

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 193 / *Medical Communications For Combat Casualty*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MC4/TMIP-J I2R3 Fielding Decision	2	2018	2	2018
System Updates #1 for TMIP-J I2R3	3	2018	3	2018
System Updates #2 for TMIP-J I2R3	4	2018	1	2019
System Updates #3 for TMIP-J I2R3	3	2019	3	2019
System Updates #4 for TMIP-J I2R3	4	2019	1	2020

Note

System Updates correspond to projected software change packages, to include security enhancements, throughout this time period. 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 cybersecurity and technology insertions for the modernized electronic health record system. .

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) 738 / *AcqBiz*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
738: *AcqBiz*	-	2.973	24.002	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	26.975
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Beginning in FY 2020 funding for the Accessions Information Environment (AIE) in support of the Army Accessions IT Development was transferred to 0605013A, Project FL9 (Army Accessioning IT Development).
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.

This program supports the development requirements for the Army Human Resources Command (USAHRC) which provides the IT solution necessary to accomplish the Army's Accessioning mission.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Program Management	2.619	11.330	-	-	-
Description: This effort provides program management in support of the Human Resource Command Accessioning IT mission. ***FY 2019 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					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 738 / *AcqBiz*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Environment (RIE) development. The Program Executive Office -Enterprise Information Systems was designated as the Office of Primary Responsibility for AIE effective 11 Oct 17 and funds were transferred starting in FY 2020. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The Program Executive Office - Enterprise Information Systems (PEO EIS) was designated as the Office of Primary Responsibility (OPR) for Accessioning Information Environment (AIE) development effective 11 Oct 17 and funds were transferred from Project Code 738 to FL9 starting in FY 2020.					
Title: Design, Development, and Test ***Description:*** This effort provides program management in support of the Human Resource Command Accessioning IT mission. ***FY 2019 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 Environment (RIE) development. The Program Executive Office -Enterprise Information Systems was designated as the Office of Primary Responsibility for AIE effective 11 Oct 17 and funds were transferred starting in FY 2020. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** See Project FL9 as resources were transferred in FY 2020 from Project 738.	0.354	11.247	-	-	-
Title: FY 2019 SBIR / STTR Transfer ***Description:*** FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer	-	1.425	-	-	-
Accomplishments/Planned Programs Subtotals	2.973	24.002	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 738 / *AcqBiz*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The ACQBIZ system will sunset and Integrated Program Management Environment (IPME) will be sustained in a commercial cloud environment in FY 2019. (PE 0605013A project: 738 TO PE 0605803A)

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) 738 / *AcqBiz*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Option/ FFP	ACC : Rock Island, IL	20.174	-		22.577		-		-		-	0.000	42.751	-
		Subtotal	20.174	-		22.577		-		-		-	0.000	42.751	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Analysis and Design, Development, Integration	TBD	TBD : TBD	85.474	-		-		-		-		-	Continuing	Continuing	Continuing
ARISS	C/CPFF	SAIC : RESTON, VA	-	2.973	Feb 2018	-		-		-		-	0.000	2.973	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		1.425		-		-		-	0.000	1.425	-
		Subtotal	85.474	2.973		1.425		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	105.648	2.973		24.002		-		-		-	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 738 / *AcqBiz*

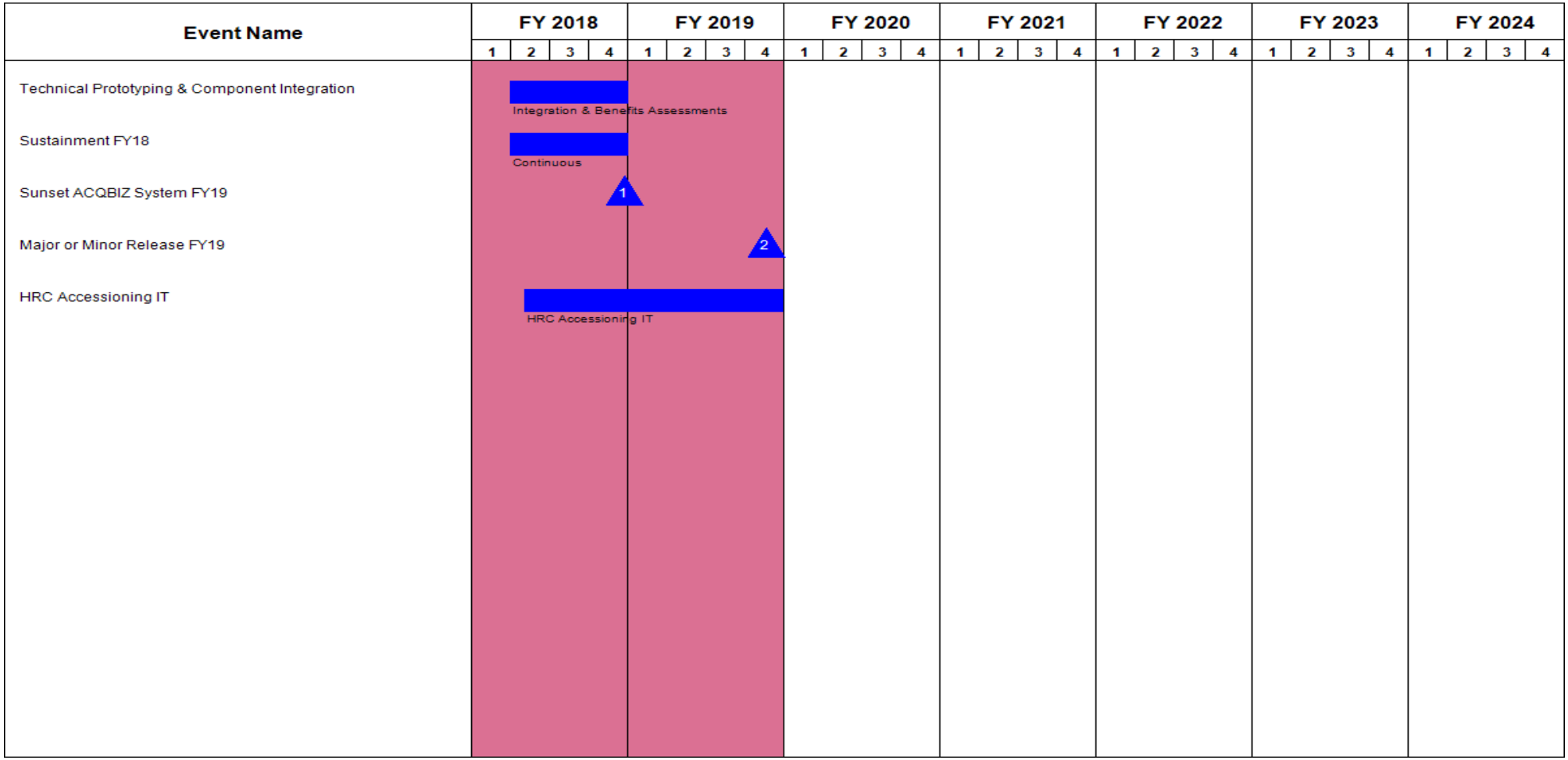

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** 738 / *AcqBiz*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Technical Prototyping & Component Integration	1	2006	4	2018
Sustainment FY18	1	2006	4	2018
Sunset ACQBIZ System FY19	4	2018	4	2018
Major or Minor Release FY19	4	2019	4	2019
HRC Accessioning IT	2	2018	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*				Project (Number/Name) FE9 / *ALTESS (P&R Forms)*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
FE9: *ALTESS (P&R Forms)*	-	0.105	0.112	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.217
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project funds the P&R Forms application; which 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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Continued development of the Army's Budget System ***Description:*** 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. ***FY 2019 Plans:*** System enhancements to improve reliability of form data and efficiency of form creation. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Transferring to sustainment in FY 2020.	0.105	0.112	-	-	-
Accomplishments/Planned Programs Subtotals	0.105	0.112	-	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) FE9 / *ALTESS (P&R Forms)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
P&R System	SS/ Various	ALTESS : Radford, Virginia	0.112	0.105		0.112		-		-		-	0.000	0.329	-
		Subtotal	0.112	0.105		0.112		-		-		-	0.000	0.329	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.112	0.105		0.112		-		-		-	0.000	0.329	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FE9 / *ALTESS (P&R Forms)*

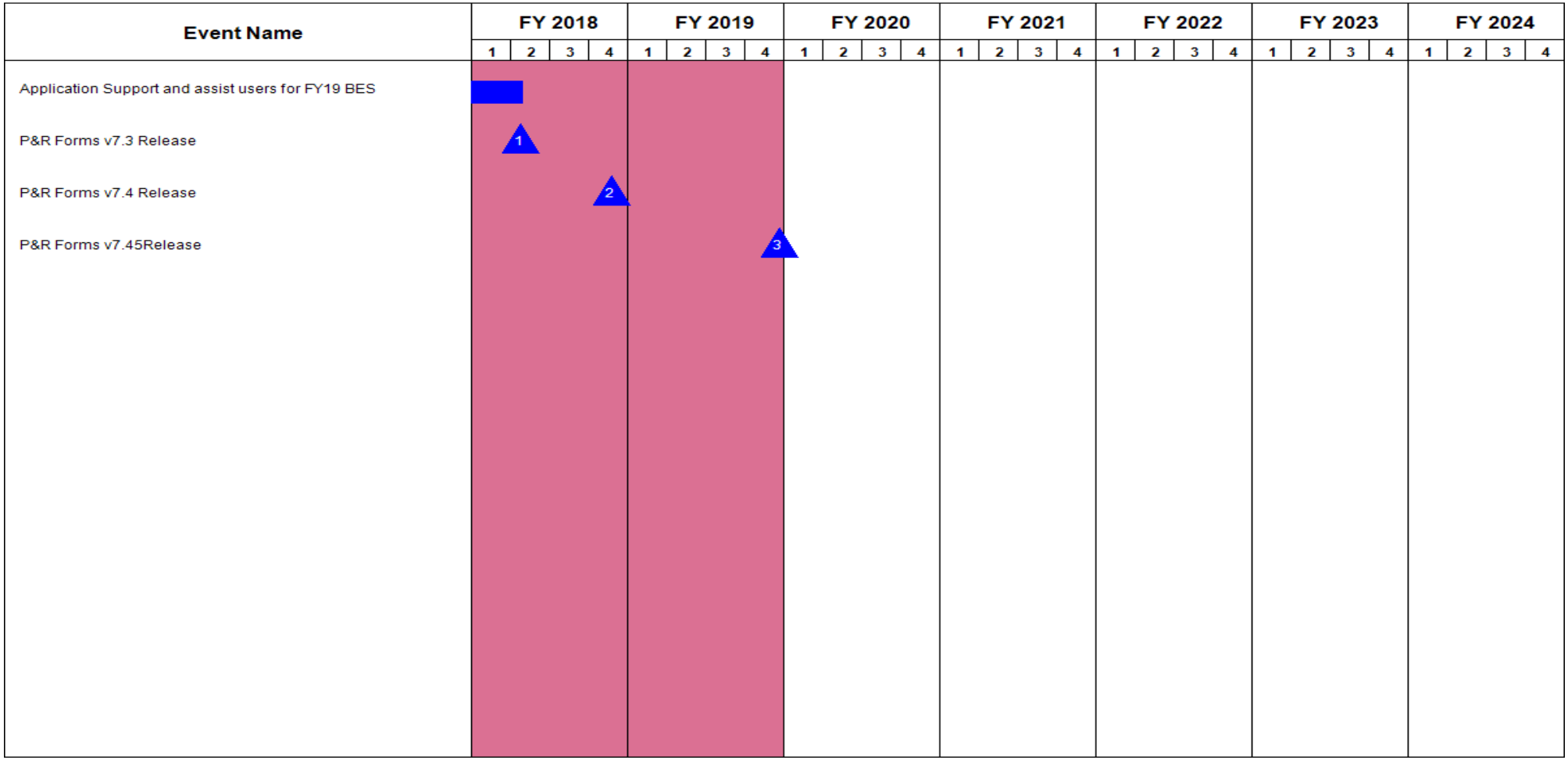

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FE9 / *ALTESS (P&R Forms)*

Schedule Details

	Start		End	
Events	**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 v7.3 Release	2	2018	2	2018
P&R Forms v7.4 Release	4	2018	4	2018
P&R Forms v7.45Release	4	2019	4	2019

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*				Project (Number/Name) FL9 / *Army Accessioning IT Development*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
FL9: *Army Accessioning IT Development*	-	0.000	0.000	43.432	-	43.432	43.647	26.262	8.307	6.952	0.000	128.600
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is not a new start. Funding was realigned into Project FL9 for greater transparency.
Accessions Information Environment (AIE): Previous funding included in PE 0605013A Project 738.
HRC Accessioning IT: Previous funding included in PE 0605013A Project 738.
Army Suicide Prevention: Previous funding included in PE 0604715A Project 241.
FY19 PE 0605013A Project 738 was a shared line between AIE and HRC Accessioning IT programs and then realigned into Project FL9 for greater transparency for FY20.

A. Mission Description and Budget Item Justification

Accessions Information Environment (AIE): supports the Army's Accessions Enterprise (AIE). The AIE aligns authorities, responsibilities, and resources, for Total Army accessions. It provides the Army's strength through its four missions: (1) enlist Soldiers, (2) commission Officers, (3) fulfill In-Service requirements, and (4) support and sustain. The AIE will replace a majority of the current legacy Accessions IT systems. Successful implementation is of upmost priority for the enterprise. The Accessions Information Environment (AIE) is a COTS-based information technology (IT) software system planned to modernize the Army's Accessions Enterprise. It will be a fully integrated Army-wide enterprise level software system for the accessions workforce to acquire the best-qualified warfighting talent (officer/enlisted/internal recruiting requirements/civilians) to meet all Army manning requirements. The key functions for AIE will include the following core capabilities: lead generation & management, prospecting, interviewing, processing, intelligence, marketing, training & leader development, and pay & incentives. This effort will ultimately ensure the accessions workforce has the information needed to engender commitments, lead future Soldiers, and engage communities in direct contact with young Americans.

HRC Accessioning IT: In addition, this program supports the development requirements for the Army Human Resources Command (USAHRC) which provides the IT solution necessary to accomplish the Army's Accessioning mission. Supports the ongoing development efforts which provides for the IT solutions necessary to accomplish the Army's Accessioning mission.

Army Suicide Prevention: This Program Element (PE) develops a pre-entry or entry assessment package that enhances the Soldier Lifecycle (e.g., selection, assignment, training, leader development). This PE enhances the Army's ability to identify individuals with a higher likelihood of having already experienced, or of potentially experiencing, sub- clinical behavioral issues, as well as to identify character strengths (e.g., resilience, grit), to ensure that the Army can meet mission requirements in the current and future operating environments. Research in this PE will result in more precise determinations of individual potential for future successful service, and more targeted identification of need for individual assistance (e.g., intervention, training, behavioral health) to increase likelihood of future success.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FL9 / *Army Accessioning IT Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Accessions Information Environment (AIE) ***Description:*** AIE will provide a fully integrated enterprise level COTS-based capability enabling transparency, efficiency and effectiveness of the accessions workforce to acquire best-qualified talent to meet all Army manning requirements. It will ultimately replace the current aging systems that have been in existence for over 30 years. The AIE acquisition program is utilizing the DoD 5000.75 Business Capability Acquisition Cycle (BCAC) currently in Phase 2, the Business Solution Analysis phase. ***FY 2020 Base Plans:*** AIE will continue prototyping efforts started in FY2019. In FY 2020, the AIE program will enter the Acquisition, Testing and Deployment phase within the DoD 5000.75 acquisition process. This phase will allow the prototype capability to be matured and initiate delivery of functional capabilities as planned within iterative Capability Waves. Specifically, the FY 2020 funding will support iterative Wave requirements analysis, design, capability configuration, interface development, system integration, cybersecurity authorization, testing, and training in order to validate the prototype solution. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This is not a new start. Funding was moved into Project FL9 for greater transparency. Previous funding included in PE 0605013A Project 738. Funding allows for the program to continue prototyping a COTS based IT solution for the accessions workforce to support the Army's Accessions mission.	-	-	37.453	-	37.453
Title: HRC Accessioning IT ***Description:*** Funding supports the development requirements for the Army Human Resources Command (USAHRC) which provides the IT solution necessary to accomplish the Army's Accessioning mission. Support USAHRC ongoing development efforts which provides for the IT solutions necessary to accomplish the Army's Accessioning mission. ***FY 2020 Base Plans:*** The FY 2020 funds support the Army's Accessioning Mission to include the Army Recruiting Information Support System (ARISS). Efforts are ongoing to support Financial Audit Readiness Requirement and technical requirements gathering, analysis and documentation to support TRADOC mission. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	-	-	3.848	-	3.848

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
See Project 738 as resources were transferred to FL9 in FY 2020.					
Title: Army Suicide Prevention ***Description:*** This Program Element (PE) develops a pre-entry or entry assessment package that enhances the Soldier Lifecycle (e.g., selection, assignment, training, leader development). This PE enhances the Army?s ability to identify individuals with a higher likelihood of having already experienced, or of potentially experiencing, sub-clinical behavioral issues, as well as to identify character strengths (e.g., resilience, grit), to ensure that the Army can meet mission requirements in the current and future operating environments. Research in this PE will result in more precise determinations of individual potential for future successful service, and more targeted identification of need for individual assistance (e.g., intervention, training, behavioral health) to increase likelihood of future success. Work in this PE is performed by the U.S. Army Resiliency Directorate in Arlington, VA. Not a new start, funds transferred from PE 0604715A in FY 2020 for greater transparency. ***FY 2020 Base Plans:*** This effort develops a pre-entry or entry assessment package, identifying risk of sub-clinical behavioral issues and identifying character strengths, to enhance the Soldier Lifecycle (e.g., selection, assignment, training, leader development). FY 2020 funding will support validation assessment of the instruments. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Not a new start, funds transferred from PE 0604715A in FY 2020 for greater transparency.	-	-	2.131	-	2.131
Accomplishments/Planned Programs Subtotals	-	-	43.432	-	43.432

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Accessions Information Environment (AIE):
AIE is following the streamlined Acquisition process for Defense Business Systems (DBS) in accordance with DoD 5000.75 and is targeted to be designated as a Business System Category (BSC) II program.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FL9 / *Army Accessioning IT Development*

AIE is pursuing a rapid prototyping approach to acquire innovative COTS technologies to support the Army's Accessions needed capabilities. A competitive prototype contract will be awarded to execute the prototype phase. The prototyping efforts will result in capability to be delivered in waves:
Infrastructure & Application Pilot (Wave 1): Includes foundational operational capabilities such as commercial cloud & network capabilities, initial data migration from legacy systems, critical interfaces, defined data models, and initial lead generation & management process build out.
Wave 1 Application Pilot: Includes key software capabilities to support the Army's Accessions mission. These processes will enable the transition from "civilian to soldier".
Waves 2-5: Additional automated capability to support optimization of accessions business processes.

At the completion of the Waves, AIE will deliver the lead generation & management, prospecting, interviewing, processing, intelligence, marketing, training & leader development, and pay & incentives capabilities to support the Army's Accessions mission. Capabilities will be delivered using an agile methodology.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) FL9 / *Army Accessioning IT Development*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AIE - Management Services	C/CPFF	Various : Various	-	-		-		3.100	Dec 2019	-		3.100	0.000	3.100	23.200
		Subtotal	-	-		-		3.100		-		3.100	0.000	3.100	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AIE: COTS Based Solution Configuration and Developmentand Development	C/FP	Various : Various	-	-		-		33.553	Nov 2019	-		33.553	0.000	33.553	165.480
ARISS	C/CPFF	SAIC : Reston, VA	-	-		-		3.848	Jan 2020	-		3.848	0.000	3.848	-
Army Suicide Prevention	TBD	TBD : TBD	-	-		-		2.131		-		2.131	Continuing	Continuing	Continuing
		Subtotal	-	-		-		39.532		-		39.532	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AIE - Facilities and Equipment Costs	C/CPFF	Various : Various	-	-		-		0.800	Jan 2020	-		0.800	0.000	0.800	0.800
		Subtotal	-	-		-		0.800		-		0.800	0.000	0.800	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		43.432		-		43.432	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FL9 / *Army Accessioning IT Development*

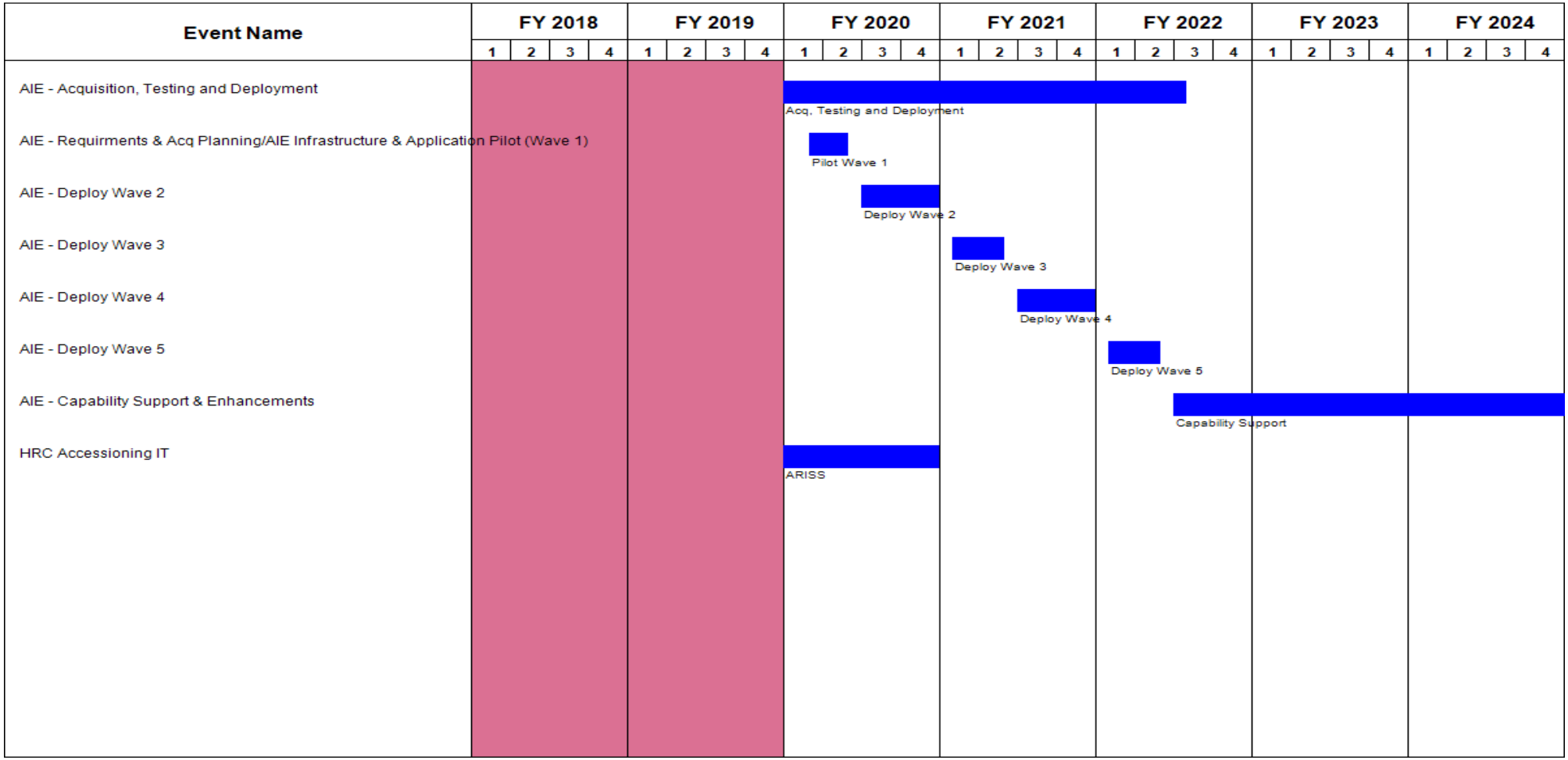

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FL9 / *Army Accessioning IT Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AIE - Acquisition, Testing and Deployment	1	2020	3	2022
AIE - Requirments & Acq Planning/AIE Infrastructure & Application Pilot (Wave 1)	1	2020	2	2020
AIE - Deploy Wave 2	3	2020	4	2020
AIE - Deploy Wave 3	1	2021	2	2021
AIE - Deploy Wave 4	3	2021	4	2021
AIE - Deploy Wave 5	1	2022	2	2022
AIE - Capability Support & Enhancements	3	2022	3	2032
HRC Accessioning IT	1	2020	4	2020

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*				Project (Number/Name) FM7 / *Human Resouces Information Technology*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
FM7: *Human Resouces Information Technology*	-	0.000	0.000	9.932	-	9.932	13.896	13.677	13.718	7.784	0.000	59.007
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Efforts in project FM7 transitioned from 0605013A T05 in FY 2020 for greater transparency.

A. Mission Description and Budget Item Justification

The efforts under this project support the Army's Human Resources Information Technology needs.

SOLDIER FOR LIFE-TRANSITION ASSISTANCE PROGRAM XXI (SFL-TAP XXI): The Transition Assistance Program XXI (TAP-XXI) application provides an interactive, multimedia approach to pre-separation counseling and job assistance training. This application uses full motion video, graphics, and sound to train clients; and schedules clients for classroom-type instruction. It integrates a complete range of transition services and benefits for service members, Department of Defense civilian employees, and their family members as they transition from the military. TAP-XXI is a web-based, three-tiered application with a centralized database for all Transition sites. The user interface is browser-based, the application is based on a storefront intranet model to provide access from within Transition centers. The requirements in place today represent a 300 percent increase over the pre-VOW requirements. A significant modernization effort within TAP XXI is needed. Justification: ($ in Millions) FY2019 Base procurement dollars in the amount of $0.606 million resources the TAP XXI modernization requirements. Planned Program includes modernize client management module, Soldier module, and increase reporting capabilities.

Human Resource Command (HRC) Core IT: This program supports efforts to plan, design, develop, and test Information Technology (IT) solutions to fulfill the Army's Warfighter Support Mission, accommodate emerging Army requirements, and fulfill Future Army needs. Ongoing development efforts support multiple functional areas including logistics, personnel, transportation, training, medical/health protection, and the sustaining base. The focus of the rationalization effort is to identify value-added applications capable of serving a broader Army enterprise audience and garnering efficiencies through the elimination of outdated, legacy, and duplicative applications. Applications are upgraded or enhanced to meet compliance with Army Common Operating Environment standards in accordance with Army Application Management Business Office (AAMBO). Additionally, program supports enhancements and modifications to the Interactive Personnel Electronic Records Management System (iPERMS) and iPERMS-Secure (iPERMS-S), as well as development of interfaces based upon emerging requirements, Cybersecurity, functionality and compliance with Army standards.

R-Builder is a living application database system that allows the Manning Program Evaluation Group (MM PEG) to update the database to include various cost drivers and factors used for programming, budgeting for all Army Service members pay, allowances, and benefits for the all-volunteer Army. R-Builder is used to develop the annual Program Objective Memorandum -Budget Estimate Submission (POM-BES), and to develop and manage the Army's military and civilian personnel in order to execute the President's National Security Strategy.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

The Army Review Board Agency (ARBA) operates under the delegated authority of the Secretary of the Army as the final level of appeal for service members in uniform, veterans, and their family members, adjudicating tens of thousands of claimed errors or injustices annually. ARBA is staffed with 128 military personnel, civilians, and contractors, and additional 350 external Advisors and Boards Members. ARBA struggles with the substantial process and system-related inefficiencies. The Agency currently uses the ARBA Case Tracking System (ACTS) to facilitate case adjudication and the routing of corresponding hard copy case files (a.k.a. "redwelds"). This system was custom built in 1999, strictly for tracking the hand offs of redwelds. At its inception, ACTS was a huge leap forward; however, as the organization and technology evolved, the system has not been able to meet new Agency mission objectives and streamlining initiatives. This antiquated system costs the Agency multi-millions in annual sustainment fees and lacks the agility to address changing business requirements and organizational roles.

Army SHARP Data Management System (DMS) Integrated Case Reporting System (ICRS) enhancements will provide stabilization for sexual harassment (SH) data collection, reporting requirements, and analytic processes; ICRS maintains Army sexual assault (SA) legacy data collected prior to 2014 in the Sexual Assault Data Management System (SADMS) IAW public law.

ARIMS is the Army's policy and enterprise system deployed to meet statutory (36 CFR) and regulatory (AR 25-1, AR 25-400-2) requirements to manage records that document the policies, decisions, and actions of the Army both as a military department and federal institution. ARIMS provides approximately 64,000 (FY18) users with tools and capabilities to collect and preserve Army records, serves as the records management component of Army Knowledge On-Line, and the Secretary of the Army has mandated its use to collect and preserve Army records. ARIMS is replicated on the SIPRNet with ARIMS-Classified (ARIMS-C) to provide similar capabilities for the collection and preservation of the Army's classified records. ARIMS is an integrated system that supports the SecArmy objective to integrate management systems for the Army's records management programs and business operations. This line item funds for system, network, and application management for the ARIMS and ARIMS-C infrastructure. Technology changes, integration, and systems migration require contractor support to ensure Army Electronic Archives continues to preserve essential electronic records. These activities support the ARIMS applications and comply with the SecArmy and senior Army leadership to integrate and standardize management systems for business operations. Failure to fund will result in the loss of expertise and in extensive down time in the event of any hardware or software failure in the ARIMS infrastructure. ARIMS downtime precludes the collection and preservation of the Army long-term important records (such as CONOPS records). As a web-based GOTS system, ARIMS is dependent on private industry expertise to conduct troubleshooting and correction of any application or operating system component that is the foundation of the ARIMS and ARIMS-C systems. These skill sets are not maintained by government staff and must, by DoD directive (C3I), be acquired from the private sector.

Family Advocacy System of Records (FASOR) is the information system used by the Army to manage child and adult based abuse incidents referred by the Family Advocacy Program (FAP). FASOR is used to capture/perform incident case management and allows for standardization of reviews and incident determinations. FASOR is a key system used in FAP Army Central Registry (ACR) background checks when determining suitability of individuals to be placed into "positions of trust". Finally, FASOR facilitates reporting and data analysis in support of internal, Army, DoD, FOIA and Congressional requirements.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: ARIMS	-	-	0.995	-	0.995

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: ARIMS is the Army?s policy and enterprise system deployed to meet statutory (36 CFR) and regulatory (AR 25-1, AR 25-400-2) requirements to manage records that document the policies, decisions, and actions of the Army both as a military department and federal institution. ARIMS provides approximately 64,000 (FY18) users with tools and capabilities to collect and preserve Army records, serves as the records management component of Army Knowledge On-Line, and the Secretary of the Army has mandated its use to collect and preserve Army records. ARIMS is replicated on the SIPRNet with ARIMS-Classified (ARIMS-C) to provide similar capabilities for the collection and preservation of the Army?s classified records. ARIMS is an integrated system that supports the SecArmy objective to integrate management systems for the Army?s records management programs and business operations. This line item funds for system, network, and application management for the ARIMS and ARIMS-C infrastructure. Technology changes, integration, and systems migration require contractor support to ensure Army Electronic Archives continues to preserve essential electronic records. These activities support the ARIMS applications and comply with the SecArmy and senior Army leadership to integrate and standardize management systems for business operations. Failure to fund will result in the loss of expertise and in extensive down time in the event of any hardware or software failure in the ARIMS infrastructure. ARIMS downtime precludes the collection and preservation of the Army long-term important records (such as CONOPS records). As a web-based GOTS system, ARIMS is dependent on private industry expertise to conduct troubleshooting and correction of any application or operating system component that is the foundation of the ARIMS and ARIMS-C systems. These skill sets are not maintained by government staff and must, by DoD directive (C3I), be acquired from the private sector. This funds contractor man-years for technical and analytical expertise in the integration and validation of operational databases used to store and research combat records from combat operations in Korea, Vietnam, Somalia, Panama, Persian Gulf, Afghanistan, Iraq, and other contingency operations. The effort supports over 30 distinct and unique operational databases that directly support research into Veteran claims for Post-Traumatic Stress Disorder, Agent Orange, and other medical conditions developed by Soldiers during combat and non-combat operations. Supports the Army?s Data Center Consolidation by turning data base structure to be more efficient and reduce maintenance support costs. Increased Congressional inquiries and litigation have raised leadership awareness of the need to improve records management compliance Army-wide. SecArmy directed workgroup, led by the AASA, with participation by the CIO/G-6, NETCOM, OGC, and OCLL is to provide a comprehensive solution for the Army and integrate and standardize management systems for the Army?s business operations. Enhancing and modernizing of					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
existing ARIMS functionality and capability to support the SecArmy initiative includes updating ARIMS to support current technology such as Microsoft SharePoint environment, expanding storage capability, including network storage , and commensurate expansion of backup, security and communications capabilities over CONUS and OCONUS networks. This effort supports the ADCCP program. This effort transitioned from 0605013A T05 in FY20 and is not a new start. ***FY 2020 Base Plans:*** This line item funds contractor man-year for Middleware Software Engineering for the programming and integration of linkages between ARIMS, Army Information Systems and NARA?s Gateway, that generate or store long-term important records as part of functional business processes. Failure to fund at the requested level will preclude the efficient, effective, and transparent capture and preservation of important Army records generated by Army Information Systems. Without this capability, Army Information System managers will be required to manually extract and index records for submission and preservation in the ARIMS system. This effort supports the ADCCP program to ensure efficient use of Army resources and fulfill RMDA?s mission. This effort transitioned from 0605013A T05 in FY20 and is not a new start. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This effort transitioned from 0605013A T05 in FY20 and is not a new start.					
Title: Army SHARP Data Management ***Description:*** Army SHARP Data Management System (DMS) Integrated Case Reporting System (ICRS) enhancements will provide stabilization for sexual harassment (SH) data collection, reporting requirements, and analytic processes; ICRS maintains Army sexual assault (SA) legacy data collected prior to 2014 in the Sexual Assault Data Management System (SADMS) IAW public law. This effort transitioned from 0605013A T05 in FY 2020 and is not a new start. ***FY 2020 Base Plans:*** Enable Army leaders at all levels to manage ICRS data through E-Document Format and documents upload capabilities within ICRS. Increase data element in ICRS and complete the Sexual Assault Data Management (SADMS) integration of data into ICRS. Support Advanced Analytics capabilities, increase business intelligence	-	-	1.049	-	1.049

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
capabilities, and support predictive analysis for SHARP Data. Automate SHARP ICRS Reporting capabilities and facility integration of EORS system in to ICRS. This effort transitioned from 0605013A T05 in FY 2020 and is not a new start. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This effort transitioned from 0605013A T05 in FY 2020 and is not a new start.					
Title: G-1 Requirement Builder (R-Builder) ***Description:*** R-Builder is a living application database system that allows the Manning Program Evaluation Group (MM PEG) to update the database to include various cost drivers and factors used for programming, budgeting for all Army Service members pay, allowances, and benefits for the all-volunteer Army. R-Builder is used to develop the annual Program Objective Memorandum and Budget Estimate Submission, and develop and manage the Army's military and civilian personnel in order to execute the President's National Security Strategy. This effort transitioned from 0605013A T05 in FY 2020 and is not a new start. ***FY 2020 Base Plans:*** Continued modernization of the Army's Requirements Builder to budget better for the Army's military manpower requirements. This effort transitioned from 0605013A T05 in FY 2020 and is not a new start. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This effort transitioned from 0605013A T05 in FY 2020 and is not a new start.	-	-	0.150	-	0.150
Title: SFL-TAP XXI Modernization ***Description:*** SFL-TAP Transition Assistance Program (TAP) XXI Modernization - Modernize outdated application in order to create efficiencies and incorporate industry standards. ***FY 2020 Base Plans:***	-	-	1.219	-	1.219

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY2020 Base research and development dollars in the amount of $1.219 million to support cyber security program requirements, National Defense Authorization Act (NDAA) update requirements, and a case synopsis module. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The increase from FY2019 to FY2020 is for addition hardware (database to servers and virtual servers) to support infrastructure and personnel. Resources transferred from Project T05 to FM7 beginning in FY20.					
Title: HRC Core IT ***Description:*** HRC Core IT: This program supports efforts to plan, design, develop, and test Information Technology (IT) solutions to fulfill the Army's Warfighter Support Mission, accommodate emerging Army requirements, and fulfill Future Army needs. Ongoing development efforts support multiple functional areas including logistics, personnel, transportation, training, medical/health protection, and the sustaining base. ***FY 2020 Base Plans:*** Ongoing efforts to modify the iPERMS application to replace the functionality of SnF servers with a robust scanning Web Service that will support the ARNG, 55 Military Personnel Offices (MILPOs), and remote users globally. Development is required ensure compliance with Defense Information Systems Agency Core Data Center and Cybersecurity requirements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Inflation. Resources were transferred from Project T05.	-	-	2.942	-	2.942
Title: ARBA ***Description:*** The Army Review Board Agency (ARBA) operates under the delegated authority of the Secretary of the Army as the final level of appeal for service members in uniform, veterans, and their family members, adjudicating tens of thousands of claimed errors or injustices annually. ARBA is staffed with 128 military personnel, civilians, and contractors, and additional 350 external Advisors and Boards Members. ARBA struggles with the substantial process and system-related inefficiencies. The Agency currently uses the ARBA Case Tracking System (ACTS) to facilitate case adjudication and the routing of corresponding hard copy case files (a.k.a. ?redwelds?). This system was custom built in 1999, strictly for tracking the hand offs of redwelds. At its inception, ACTS was a huge leap forward; however, as the organization and technology evolved, the system has not been able to meet new Agency mission objectives and streamlining initiatives. This	-	-	1.600	-	1.600

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
antiquated system costs the Agency multi-millions in annual sustainment fees and lacks the agility to address changing business requirements and organizational roles. ***FY 2020 Base Plans:*** FY 2020 funding is to modernize and re-engineer the current ARBA Case Tracking System (ACTS) that is in sustainment. ARBA?s leadership has aggressively driven business process reengineering to include end-to-end case digitization. However, ACTS? inflexibility stands in the way of Agency progress on many fronts and negatively affects the timeliness, costs, and quality of ARBA?s work products. Additionally, ARBA has undergone increasing congressional scrutiny, unfavorable media conclusions, and publicized court remands surrounding the quality and timeliness of its 18,000 annual adjudication outcomes. As a result, ARBA leadership has committed to Congress that it will drive fundamental change across the DOTMLPF-P spectrum. In summary, these significant problems result in greatly extended processing times, bottle-necked and rushed adjudication activities, numerous redundant hand-offs, and at times incorrect or contestable board outcomes. ARBA?s current process requires labor-intensive hard copy printing, collating, transporting, filing, scanning, labeling, inventorying, shipping, shredding, mailing, and tracking of redwelds and their content. - ARBA ADS Modernization capability requirements can be summarized as follows: - Lifecycle Case Management ? End-to-end Structured Process - Complete Case Digitization (electronic cases, board scheduling/voting, approvals, signatures) - Improved External Stakeholder Exchange and Case Transit - Leverage Historical Information/Comprehensive Knowledge Management Capability - Performance Assessment Framework ? Real-Time, Reliable Metrics - Modern, Flexible and Reliable IT Platform Supporting Mobility and Information Exchange ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This is a new start effort.					
Title: Family Advocacy System of Records (FASOR) ***Description:*** FASOR is the information system used by the Army to manage child and adult based abuse incidents referred by the Family Advocacy Program (FAP). FASOR is used to capture/perform incident case management and allows for standardization of reviews and incident determinations. FASOR is a key system used in FAP Army Central Registry (ACR) background checks when determining suitability of individuals to	-	-	1.977	-	1.977

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
be placed into "positions of trust". Finally, FASOR facilitates reporting and data analysis in support of internal, Army, DoD, FOIA and Congressional requirements. ***FY 2020 Base Plans:*** Continued research and development for modernization and compliance requirements to start in FY 2019. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This effort transitioned from 0605013A T05 in FY 2020 and is not a new start.					
Accomplishments/Planned Programs Subtotals	-	-	9.932	-	9.932

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The HRC Soldier for Life TAP XXI system is currently live and requires modernization.

The Army SHARP Program is coordinating with 2 STAR Army Business Council (ABC) August FY 2018 Senior Leader Review Board to obtain approval to enhance the system. Currently, we are in the Business Capability Acquisition Cycle (BCAC), Capability Requirements Document (CRD).

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) FM7 / *Human Resouces Information Technology*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SFL--TAP	TBD	To Be Determined : To Be Determined	-	-		-		0.610		-		0.610	0.000	0.610	-
		Subtotal	-	-		-		0.610		-		0.610	0.000	0.610	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARIMS	TBD	TBD : TBD	-	-		-		0.995		-		0.995	Continuing	Continuing	Continuing
Army SHARP Data Management	TBD	Data Management : TBD	-	-		-		1.049		-		1.049	Continuing	Continuing	Continuing
SFL-TAP	TBD	To Be Determined : To Be Determined	-	-		-		0.609		-		0.609	0.000	0.609	-
HRC Core IT	TBD	To Be Determined : To Be Determined	-	-		-		2.942	Aug 2020	-		2.942	0.000	2.942	-
ARBA	TBD	TBD : TBD	-	-		-		1.600		-		1.600	0.000	1.600	-
		Subtotal	-	-		-		7.195		-		7.195	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
G-1 Requirements Builder (RBuilder)	TBD	TBD : TBD	-	-		-		0.150		-		0.150	0.150	0.300	-
Family Advocacy System of Records (FASOR)	TBD	TBD : TBD	-	-		-		1.977		-		1.977	Continuing	Continuing	Continuing
		Subtotal	-	-		-		2.127		-		2.127	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) FM7 / *Human Resouces Information Technology*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		9.932		-		9.932	Continuing	Continuing	N/A

Remarks

SFL-TAP has no additional changes from FY19-20

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

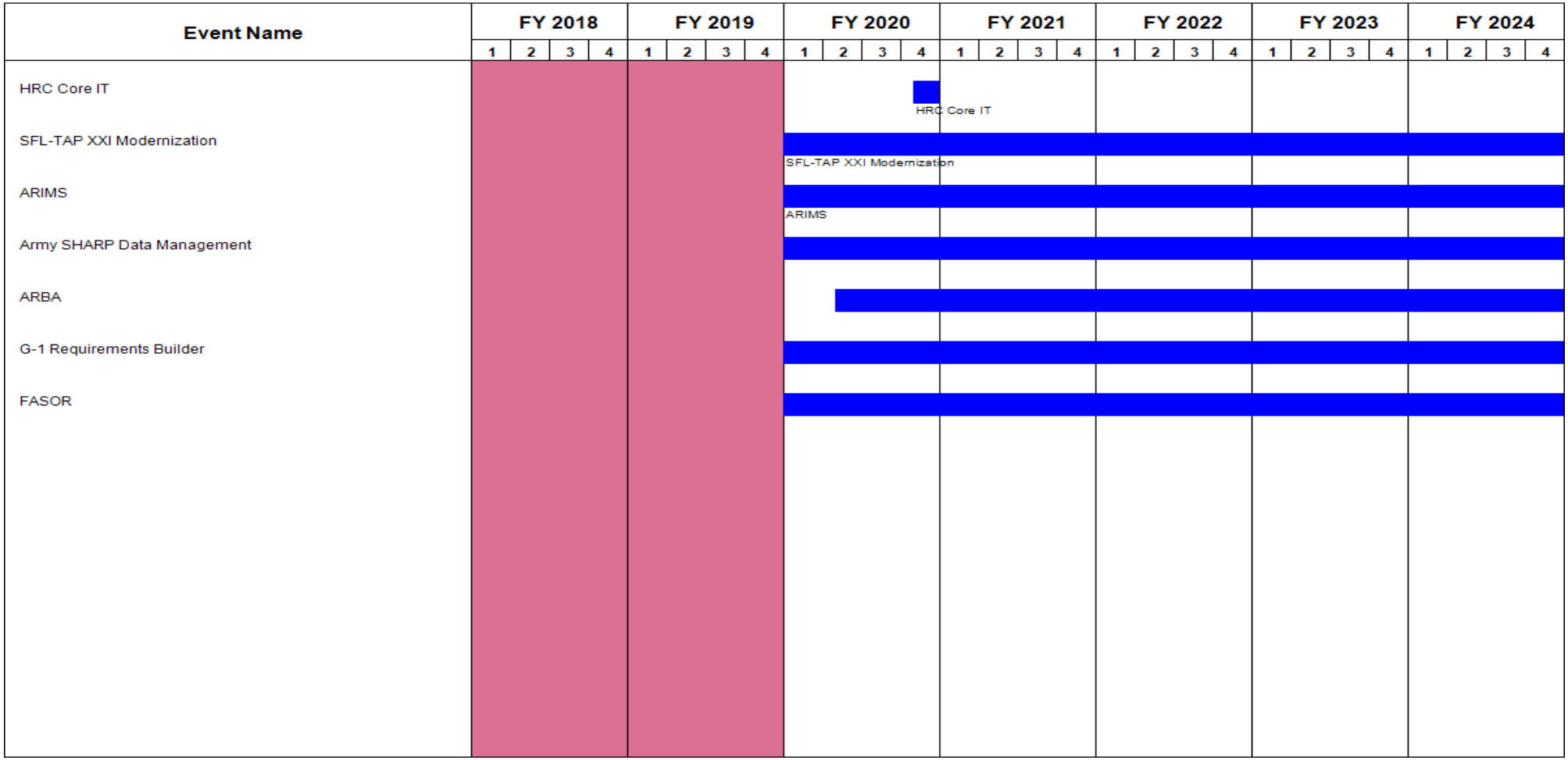

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM7 / *Human Resouces Information Technology*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
HRC Core IT	4	2020	4	2020
SFL-TAP XXI Modernization	1	2020	4	2024
ARIMS	1	2020	4	2024
Army SHARP Data Management	1	2020	4	2024
ARBA	2	2020	4	2024
G-1 Requirements Builder	1	2020	4	2024
FASOR	1	2020	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*				Project (Number/Name) FM8 / *Information Technology for Training Systems*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
FM8: *Information Technology for Training Systems*	-	0.000	0.000	40.720	-	40.720	35.290	34.270	24.958	4.611	0.000	139.849
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Not a new start. Funding was moved from 0605013A Project T05 to Project FM8 starting in FY 2020 for greater transparency.

A. Mission Description and Budget Item Justification

This project funds information technology systems that support Army Training.

The Army Training Information System (ATIS) is designated a Defense Business System (DBS) that will develop, integrate, test, deliver, operate, and maintain an enterprise capability for the army training and education communities. 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.

ATIS Capabilities include:
- Training Development. Provides centralized access to training information anytime, anywhere, including educational and professional instruction.
- Training Management. Provides centralized ability to access and manage information, including individual and collective/unit training that supports mission tasks and individual training records.
- Enterprise Scheduling. Provides a single integrated set of applications to schedule training resources, including transportation, classrooms, ranges, supplies, and mandated legal/social individual and unit training.
- Content Management. Provides centralized access to training information anytime, anywhere, including educational and professional instruction.
- Resource Management. Provides ability to manage availability/sustainability of training enablers and resources.

Enhancement of Army Training Models (ATM) will provide the resources to build and sustain readiness requirements in a standardized process for automated methodology development and resource allocation in support of the Army's training needs.

The Army Career Tracker is leader development tool that leverages Army's prior investments to integrate education, training, assignment, self-development and other systems by linking these valuable technologies and resources into a common user-friendly portal across 1.35 million users consisting of enlisted, officers, and civilians. 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 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

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

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 Army's success. Users manage their lifelong learning career objectives, monitor progress towards career development and goals, search multiple Army education and training resources, and receive personalized advice from their supervisor and Army leadership.
Completed development will modernize the Army Career Tracker (ACT) system to render web pages correctly base on the size of the screen. Responsive Web Design (RWD) is an approach to web design that renders web pages based on the size of the device's display screen (e.g., computer, tablet, and phone). This allows the site to load quickly and ensures the display appears as if it were made expressly for the device being used. RWD improves user experience by displaying messages, links, and controls in a logical manner regardless of the device. The actual presentation may not look the same across different devices; rather the rendering will depend on the Operating System (OS), screen size, screen resolution, and other factors. Implementing RWD on ACT would be a step forward toward allowing ACT to render better on tablets and other mobile devices (e.g., mobile phones).

Universal Course Authoring Tool / The UCAT (Universal Curriculum and Assessment Tool) will serve as the primary curriculum and assessment development tool for curriculum development projects in meeting the directives from higher headquarters to transition into a new, digital learning environment. UCAT will support the delivery of curriculum and assessment products on a variety of different platforms in support of both resident and non-resident programs. UCAT consists of server-side applications and associated web services, databases, and client-side components which are currently under development.

MIT LL Networked Pronunciation Feedback Program (NETProf) expansion will allow for further expansion and further utilization of the existing NetProF products for DLIFLC faculty and students. To reach higher levels of proficiency in foreign languages the planned dialog system would give an advantage to DLIFLC teachers to help students gain advances through practicing speaking using this new dialog system, and the connected NetProF improvement system for pronunciation for longer utterances. This feasibility study will help set new parameters for developing very advanced language teaching systems that otherwise could not be supported. This is in support of the 2+/2+/2 plan.

DLPT5 Content Analysis, Categorization & Modeling Development of DLPT5 Content Analysis, Categorization and Modeling (CACM) capabilities. For integration within the DLIFLC MIT LL TIDWA Domino system. These capabilities are in direct response to DLIFLC's DoDI assigned responsibilities for DLPT item bank maintenance, psychometric analysis and informed pool management, and closely support the DLPT Validity Framework.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Army Training Information System (ATIS)	-	-	37.990	-	37.990
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.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2020 Base Plans: Funding to initiate development of the objective Army Training Information System (ATIS) including achievement of the Acquisition Authority to Proceed (A-ATP) milestone and the contract award of the developmental contract. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increased funding will be used to fund activities from the prototype phase to initiate development of the Army Training Information System (ATIS).					
Title: Enhancement of Army Training Models (ATM) ***Description:*** Enhancement of Army Training Models (ATM) will provide the resources to build and sustain readiness requirements in a standardized process for automated methodology development and resource allocation in support of the Army's training needs. ***FY 2020 Base Plans:*** The performance objective is to modernize and enhance forecasting of training requirements and produce deliverables in support of the Planning, Programming, Budgeting and Execution (PPBE) cycle. These deliverables will also include improvement of the MDEP validation process (MVP) for CYBER, Missions, Intelligence, and other non-operational activities. Enhancements will provide the resources to build and sustain readiness requirements in a standardized process for automated methodology development and resource allocation. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This is a new start in FY 2020.	-	-	0.500	-	0.500
Title: Army Career Tracker ***Description:*** The Army Career Tracker (ACT) is leader development tool that leverages Army?s prior investments to integrate education, training, assignment, self-development and other systems by linking these valuable technologies and resources into a common user-friendly portal across 1.35 million users consisting of enlisted, officers, and civilians. Modify the existing Individual Development Plan (IDP) feature in the Army Career Tracking (ACT) system. ***FY 2020 Base Plans:*** Modernization developmental requirements will add new capabilities to render web pages correctly base on the size of the screen. Responsive Web Design (RWD) is an approach to web design that renders web pages	-	-	0.805	-	0.805

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
based on the size of the device's display screen (e.g., computer, tablet, and phone). This allows the site to load quickly and ensures the display appears as if it were made expressly for the device being used. RWD improves user experience by displaying messages, links, and controls in a logical manner regardless of the device. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This is not a new start, funding was transferred from project T05 to FM8 for greater transparency.					
Title: Universal Course Authoring Tool (UCAT) ***Description:*** The UCAT (Universal Curriculum and Assessment Tool) will serve as the primary curriculum and assessment development tool for curriculum development projects in meeting the directives from higher headquarters to transition into a new, digital learning environment. UCAT will support the delivery of curriculum and assessment products on a variety of different platforms in support of both resident and non-resident programs. UCAT consists of server-side applications and associated web services, databases, and client-side components which are currently under development. ***FY 2020 Base Plans:*** This will be complete in FY 2021, to prepare for this, in FY 2020 we will be looking at the overall project and making any final adjustments to ensure completion on time. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This is not a new start, funding was transferred from project T05 to FM8 for greater transparency.	-	-	0.401	-	0.401
Title: DLPT5 Content Analysis, Categorization & Modeling ***Description:*** Development of DLPT5 Content Analysis, Categorization and Modeling (CACM) capabilities. For integration within the DLIFLC MIT LL TIDWA Domino system. These capabilities are in direct response to DLIFLC?s DoDI assigned responsibilities for DLPT item bank maintenance, psychometric analysis and informed pool management, and closely support the DLPT Validity Framework. ***FY 2020 Base Plans:*** The overall project is broken up into smaller modules. We plan on completing more modules for the project. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This is not a new start, funding was transferred from project T05 to FM8 for greater transparency.	-	-	1.024	-	1.024
Accomplishments/Planned Programs Subtotals	-	-	40.720	-	40.720

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Army Training Information System (ATIS) is a Category II Defense Business System and will follow the Business Capability Acquisition Cycle (BCAC) in accordance with DoD 5000.75. ATIS will comprise of Commercial-of-the-Shelf (COTS) and/or Government-off-the-Shelf (GOTS) that will provide a Common Operational Picture (COP) of the training environment. This will enable Commanders, leaders, Soldiers, and civilians to better understand, visualize, describe, direct, lead, and assess Army training requirements. ATIS efforts will ultimately reduce the lifecycle costs of training by retiring more than 29 duplicative, stove-piped systems and improve performance with a net centric, standards-based, architecturally compliant system. The overarching strategy is centered on three distinct acquisition phases.

Phase I - Program risk mitigation effort. Characterized by competitive selection of three vendors to develop, demonstrate and deliver to the Government three ATIS prototype systems with specified documentation.
Phase II - Each system will be evaluated at the end of the prototyping phase and one vendor will be selected for engineering, development and deployment.
Phase III - Upon full deployment of the system, a Sustainment Contract will be awarded for support and potential disposal of the system at the end of its useful life.
ATIS intends to use Interim Contractor Logistics Support (ICLS) for initial sustainment beginning at Limited Deployment and will then transition to a hybrid life-cycle sustainment using a combination of CLS and government entities at Full Deployment (FD).

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) FM8 / *Information Technology for Training Systems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ATIS Product Development	TBD	TBD : TBD	-	-		-		37.990		-		37.990	Continuing	Continuing	-
Army Career Tracker	TBD	TBD : TBD	-	-		-		0.500		-		0.500	Continuing	Continuing	Continuing
Universal Curriculum and Assessment Tool	TBD	TBD : TBD	-	-		-		0.805		-		0.805	Continuing	Continuing	Continuing
DLPT5 Content Analysis, Categorization & Modeling	TBD	TBD : TBD	-	-		-		1.024		-		1.024	Continuing	Continuing	Continuing
Enhanced Army Training Models	TBD	TBD : TBD	-	-		-		0.401		-		0.401	Continuing	Continuing	Continuing
		Subtotal	-	-		-		40.720		-		40.720	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		40.720		-		40.720	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

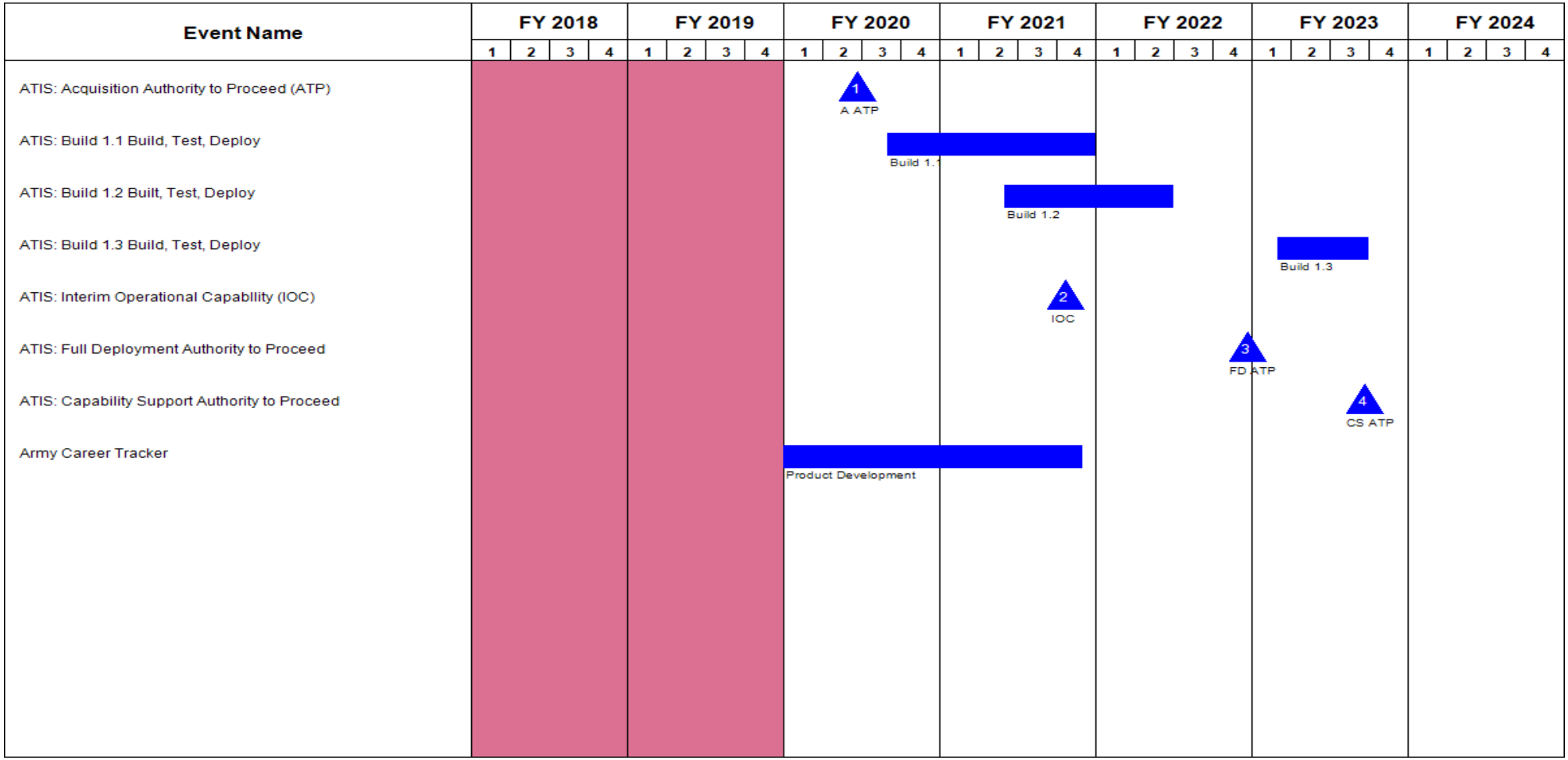

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM8 / *Information Technology for Training Systems*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ATIS: Acquisition Authority to Proceed (ATP)	2	2020	2	2020
ATIS: Build 1.1 Build, Test, Deploy	3	2020	4	2021
ATIS: Build 1.2 Built, Test, Deploy	2	2021	2	2022
ATIS: Build 1.3 Build, Test, Deploy	1	2023	3	2023
ATIS: Interim Operational Capabllity (IOC)	4	2021	4	2021
ATIS: Full Deployment Authority to Proceed	4	2022	4	2022
ATIS: Capability Support Authority to Proceed	3	2023	3	2023
Army Career Tracker	1	2020	4	2021

Note

ATIS - The ATIS program will be officially baselined at the Acquisition - Authority to Proceed (ATP).

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*				Project (Number/Name) FM9 / *Information Technology for Criminal Investigations*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
FM9: *Information Technology for Criminal Investigations*	-	0.000	0.000	1.245	-	1.245	1.237	1.242	1.245	1.247	0.000	6.216
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Not a new start. Project changed from T05 to FM9 starting in FY 2020 for greater transparency.

A. Mission Description and Budget Item Justification

Army Criminal Investigative Command has one effort for which RDT&E may be applied:

Criminal Investigative 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 in program element 0605013A will be applied to CIMS initiatives.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Criminal Investigative Management System (CIMS)	-	-	1.245	-	1.245
Description: Criminal Investigative 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					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM9 / *Information Technology for Criminal Investigations*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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 in program element 0605013A will be applied to CIMS initiatives. ***FY 2020 Base Plans:*** FY20 funds will continue to establish new congressional mandated law enforcement data transfer initiatives between multiple DoD internal and external law enforcement agencies. Provide Army law enforcement conviction data to the Federal Bureau Investigation's (FBI) National Crime Information Center (NCIC) for the prevention of the legal purchase of firearms by individuals convicted of a criminal offense. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding was transferred in FY 2020 from project T05 to FM9 for greater transparency.					
Accomplishments/Planned Programs Subtotals	-	-	1.245	-	1.245

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) FM9 / *Information Technology for Criminal Investigations*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Criminal Investigative Management System (CIMS)	C/CPFF	ACC-New Jersey : New Jersey	-	-		-		1.245	Jul 2020	-		1.245	0.000	1.245	-
		Subtotal	-	-		-		1.245		-		1.245	0.000	1.245	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		1.245		-		1.245	0.000	1.245	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM9 / *Information Technology for Criminal Investigations*

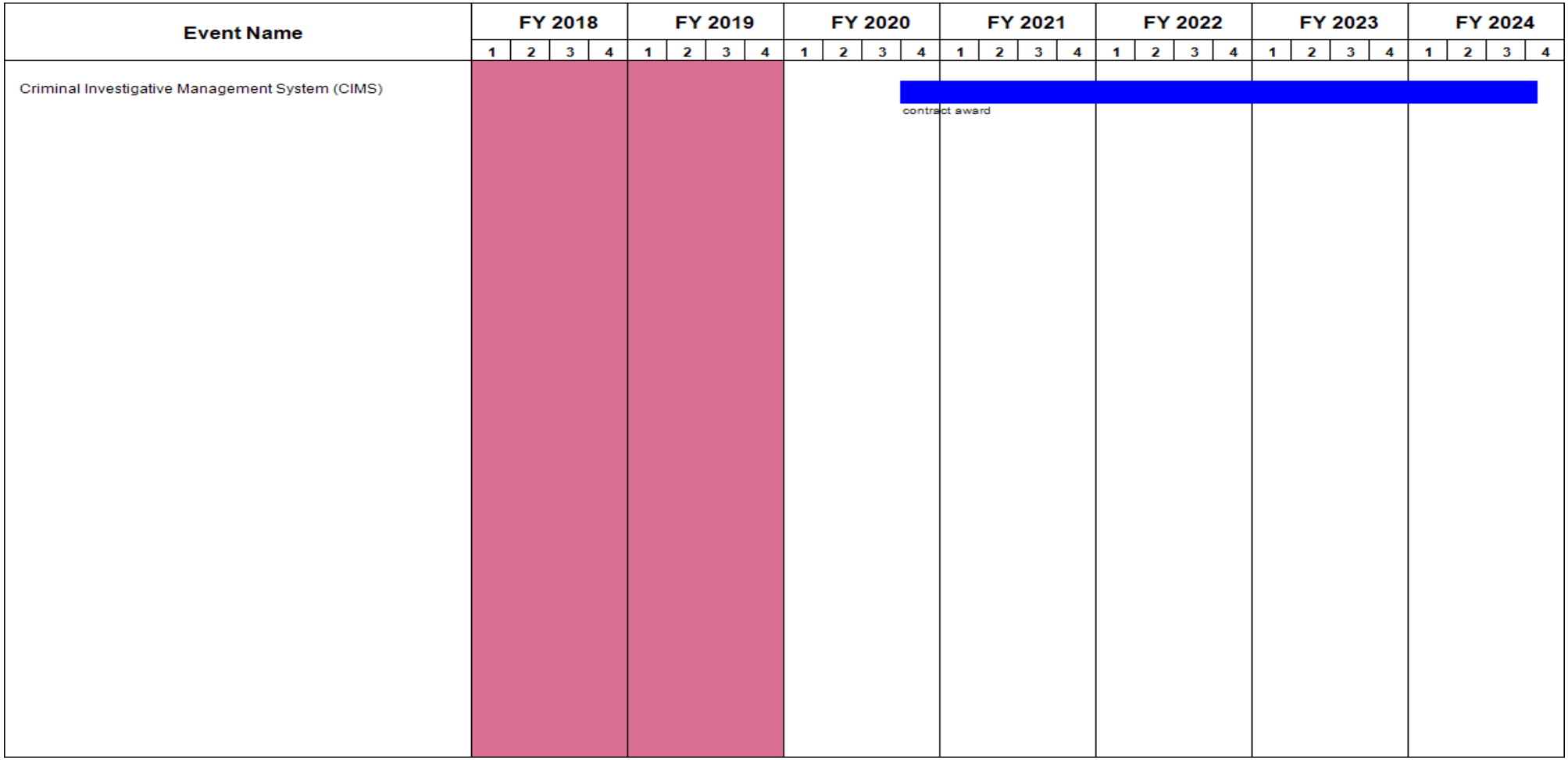

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** FM9 / *Information Technology for Criminal Investigations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Criminal Investigative Management System (CIMS)	4	2020	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) T04 / *USMEPCOM TRANSFORMTION - IT MODERNIZATION*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
T04: *USMEPCOM TRANSFORMTION - IT MODERNIZATION*	-	7.045	17.802	16.624	-	16.624	10.982	11.383	2.235	0.000	0.000	66.071
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The US Military Entrance Processing Command Integrated Resource System (MIRS) provides automation and communications capabilities to support the peacetime, mobilization and wartime military manpower accession mission for the Armed Services. USMEPCOM conducts its work through 65 Military Entrance Processing Station (MEPS) across the country and 189 Military Entrance Test Sites (METS). MIRS provides automated support for conducting aptitude tests and medical examinations and administratively processing, enlisting and shipping applicants for the Armed Forces, Reserves, and Coast Guard. This includes support for automated versions of the Armed Services Vocational Aptitude Battery (ASVAB) tests. MIRS initiates Social Security Administration (SSA) checks for identity verification; interfaces with US Citizenship & Immigration Services (USCIS) to verify citizenship status for military service applicants to screen out individuals that may be security threats; and interfaces with the Federal Bureau of Investigation (FBI) for background screening, using digital fingerprints to identify/eliminate individuals with criminal records from entering military service.

MIRS supports recruiting capabilities through electronic interfaces and data sharing, using standard Department of Defense (DoD) data elements with Recruiting Service systems. In the event a military draft is required, MIRS supports mobilization through electronic links with the Selective Service System (SSS) as well as automated support for conducting aptitude tests and medical examinations and administratively processing, inducting and shipping SSS registrants.

Customers/beneficiaries of this investment: the Accessions Community of Interest (ACOI), including components of the Army, Navy, Air Force, Marines, Coast Guard, USMEPCOM, and Office of the Secretary of Defense (OSD) Personnel & Readiness (P&R)

Stakeholders include: All Uniformed Services, Assistant Secretary of Defense (Health Affairs), Defense Transportation Management Office (DTMO), OSD P&R, Undersecretary of Defense (USD) Intel, Defense Manpower Data Center (DMDC), and Department of Veteran's Affairs.
Requested funding underpins system sustainability and scalability and improves cybersecurity to include protection of Personally Identifiable Information (PII). Funding covers costs to redesign/develop existing MIRS capabilities to operate efficiently in a cloud environment and to integrate with MHS-Genesis. This will allow for the closure of 65 Army data centers, in support of the Army Data Center Consolidation Plan (Army Directive 2016-38) and movement towards the Force of the Future mandate of all digital processing.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: USMIRS Technical Upgrade	2.483	17.802	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T04 / *USMEPCOM TRANSFORMTION - IT MODERNIZATION*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: Requested funding provides for: Technical refresh of core USMIRS functionality led by the Defense Digital Service (DDS), migrating the system to the cloud, integration and migration of remaining USMIRS System of Systems (SoS) applications, and integration of USMIRS 1.1 with Military Health System - Genesis (MHS Genesis). ***FY 2019 Plans:*** Continue update of MIRS and associated Applicant Processing applications to secure applicant data, and fielding of DDS MIRS 1.1. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 to FY 2020 decrease represents the completion of the development of core USMIRS 1.1 and supporting applications and shifts the focus to full digitization of the system.					
Title: USMIRS Modernization/Digitization ***Description:*** Requested funding supports MIRS and Force of the Future mandated efforts associated with modernization/digitization by implementing modern data analytics, expanding non-cognitive testing, and digitizing the Military Entrance Processing Station (MEPS) process. ***FY 2020 Base Plans:*** Requested funding supports the effort to bring USMEPCOM to an all digital processing state. Continues expansion of non-cognitive testing. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 to FY 2020 increase represents the completion of the development of core USMIRS 1.1 and supporting applications and shifts the focus to full digitization of the system.	4.562	-	16.624	-	16.624
Accomplishments/Planned Programs Subtotals	7.045	17.802	16.624	-	16.624

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army		Date: March 2019
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	TBD : TBD	9.645	4.562		17.802		10.089		-		10.089	0.000	42.098	-
		Subtotal	9.645	4.562		17.802		10.089		-		10.089	0.000	42.098	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development	C/Various	various : various	40.105	2.483		-		6.535		-		6.535	Continuing	Continuing	-
		Subtotal	40.105	2.483		-		6.535		-		6.535	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	49.750	7.045		17.802		16.624		-		16.624	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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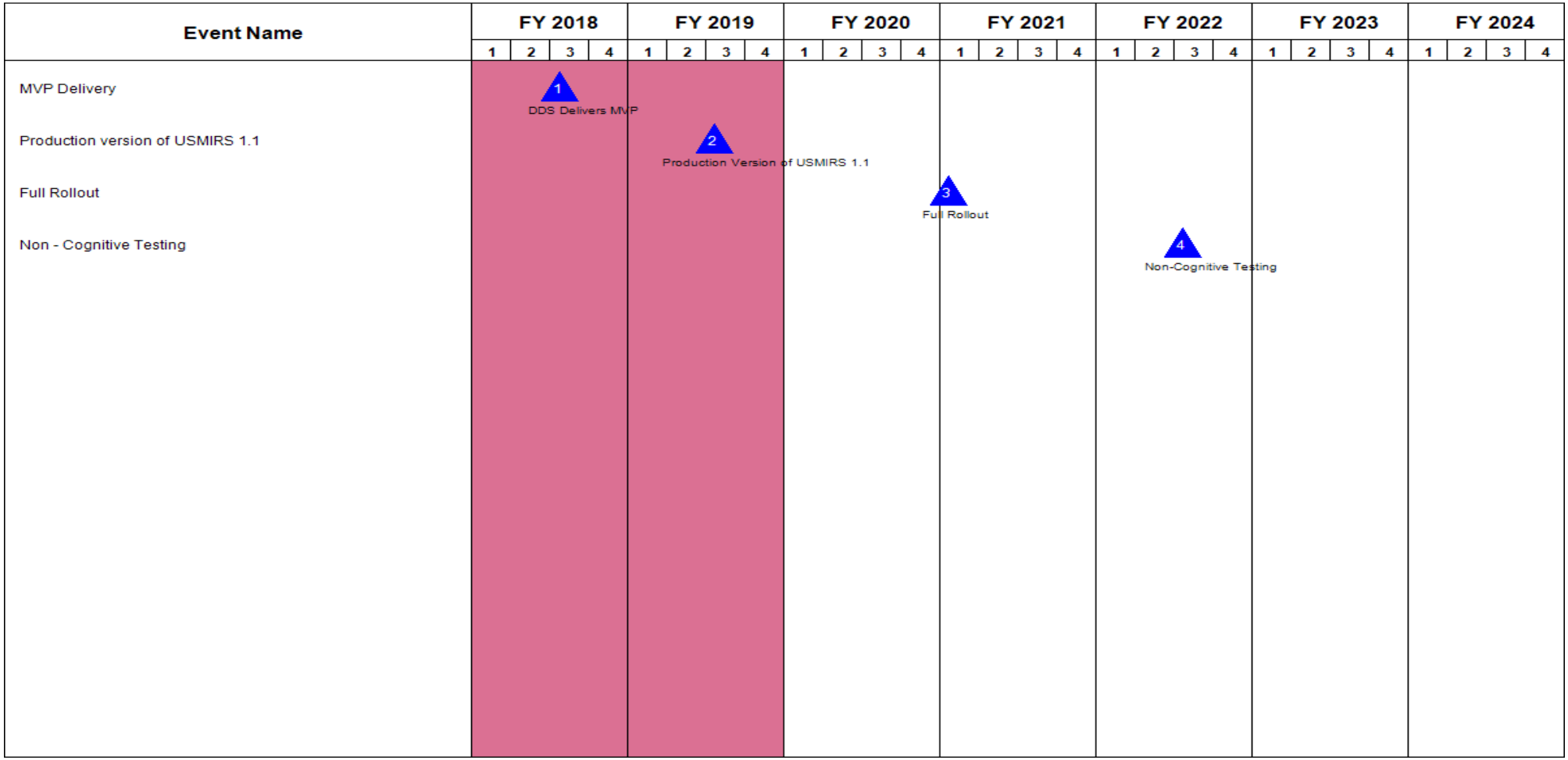

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MVP Delivery	3	2018	3	2018
Production version of USMIRS 1.1	3	2019	3	2019
Full Rollout	1	2021	1	2021
Non - Cognitive Testing	3	2022	3	2022

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army											Date: March 2019	
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COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
T05: *Army Business System Modernization Initiatives*	-	34.355	27.790	5.974	-	5.974	38.516	41.723	3.677	3.415	0.000	155.450
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The following project realignments have been completed to increase transparency within this Program Element:
- Army Safety Management Information System - Revised (ASMIS-R) funding was realigned from project T05 to project VR3 in FY 2018
- Army Accessions Information Environment (AIE) and Human Resource Command (HRC) IT development is realigned from project T05 to project FL9 in FY 2020
- Army Human Resources IT development efforts are realigned from project T05 to project FM7 in FY 2020
- Army Training IT development efforts are realigned from project T05 to project FM8 in FY 2020
- Army Criminal Investigation IT development efforts are realigned from project T05 to project FM9 in FY 2020

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.

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 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).

This program supports HRC efforts to plan, design, develop, and test Information Technology (IT) solutions to fulfill the Army's Warfighter Support Mission, accommodate emerging Army requirements, and fulfill Future Army needs. Ongoing development efforts support multiple functional areas including logistics, personnel, transportation, training, medical/health protection, and the sustaining base.

The HRC focus of the rationalization effort is to identify value-added applications capable of serving a broader Army enterprise audience and garnering efficiencies through the elimination of outdated, legacy, and duplicative applications. Applications are upgraded or enhanced to meet compliance with Army Common Operating Environment standards in accordance with Army Application Management Business Office (AAMBO). Additionally, program supports enhancements and modifications to the Interactive Personnel Electronic Records Management System (iPERMS) and iPERMS-Secure (iPERMS-S), as well as development of interfaces based upon emerging requirements, Cybersecurity, functionality and compliance with Army standards.

SOLDIER FOR LIFE-TRANSITION ASSISTANCE PROGRAM XXI (SFL-TAP XXI): The Transition Assistance Program XXI (TAP-XXI) application provides an interactive, multimedia approach to pre-separation counseling and job assistance training. This application uses full motion video, graphics, and sound to train clients; and schedules clients for classroom-type instruction. It integrates a complete range of transition services and benefits for service members, Department of Defense civilian employees, and their family members as they transition from the military. TAP-XXI is a web-based, three-tiered application with a centralized database for all Transition sites. The user interface is browser-based, the application is based on a storefront intranet model to provide access from within Transition centers. The requirements in place today represent a 300 percent increase over the pre-VOW requirements. A significant modernization effort within TAP XXI is needed. Justification: FY2019 Base procurement dollars in the amount of $606,000 resources the TAP XXI modernization requirements.

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 templets and doesn't support the higher language levels or contain testing templets. 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 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 templets and doesn't support the higher language levels or contain testing templets. 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).

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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 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).

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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: ARIMS	1.428	0.767	-	-	-
Description: ARIMS is the Army?s policy and enterprise system deployed to meet statutory (36 CFR) and regulatory (AR 25-1, AR 25-400-2) requirements to manage records that document the policies, decisions, and actions of the Army both as a military department and federal institution. ARIMS provides approximately 64,000 (FY 2018) users with tools and capabilities to collect and preserve Army records, serves as the records management component of Army Knowledge On-Line, and the Secretary of the Army has mandated its use to collect and preserve Army records. ARIMS is replicated on the SIPRNet with ARIMS-Classified (ARIMS-C) to provide similar capabilities for the collection and preservation of the Army?s classified records. ARIMS is an integrated system that supports the SecArmy objective to integrate management systems for the Army?s records management programs and business operations. This line item funds for system, network, and application management for the ARIMS and ARIMS-C infrastructure. Technology changes, integration, and systems migration require contractor support to ensure Army Electronic Archives continues to preserve essential electronic records. These activities support the ARIMS applications and comply with the SecArmy and senior Army leadership to integrate and standardize management systems for business operations. Failure to fund will result in the loss of expertise and in extensive down time in the event of any hardware or software failure in the ARIMS infrastructure. ARIMS downtime precludes the collection and preservation of the Army long-term important records (such as CONOPS records). As a web-based GOTS system, ARIMS is dependent on private industry expertise to conduct troubleshooting and correction of any application or operating system component that is the foundation of the ARIMS and ARIMS-C systems. These skill sets are not maintained by government staff and must, by DoD directive (C3I), be acquired from the private sector. This funds contractor man-years for technical and analytical expertise in the integration and validation of operational databases used to store and research combat records from combat operations in Korea, Vietnam, Somalia, Panama, Persian Gulf, Afghanistan, Iraq, and other contingency operations. The effort supports over 30 distinct and unique operational databases that directly support research into Veteran claims for Post-Traumatic Stress Disorder, Agent Orange, and other medical conditions developed by Soldiers during combat and non-combat operations. Supports the Army?s Data Center Consolidation by turning data base structure to be more efficient and reduce maintenance support costs. This line item funds contractor man-year for Middleware Software Engineering for the programming and integration of linkages between ARIMS, Army Information Systems and NARA?s Gateway, that generate or store long-term important records as part of functional business processes. Failure to fund at the requested					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
level will preclude the efficient, effective, and transparent capture and preservation of important Army records generated by Army Information Systems. Without this capability, Army Information System managers will be required to manually extract and index records for submission and preservation in the ARIMS system. This effort supports the ADCCP program to ensure efficient use of Army resources and fulfill RMDA?s mission. Increased Congressional inquiries and litigation have raised leadership awareness of the need to improve records management compliance Army-wide. SecArmy directed workgroup, led by the AASA, with participation by the CIO/G-6, NETCOM, OGC, and OCLL is to provide a comprehensive solution for the Army and integrate and standardize management systems for the Army?s business operations. Enhancing and modernizing of existing ARIMS functionality and capability to support the SecArmy initiative includes updating ARIMS to support current technology such as Microsoft SharePoint environment, expanding storage capability, including network storage, and commensurate expansion of backup, security and communications capabilities over CONUS and OCONUS networks. This effort supports the ADCCP program. This effort transitions to 0605013A project FM7 in FY20. ***FY 2019 Plans:*** Continue to provide for contractor man-years to upgrade the government owned, contractor developed applications to meet future DOD and Army required security and operational protocols. Continue to add new functionality and update core software coding to these applications to increase productivity, decrease processing backlogs, and meet new requirements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This effort transitions to 0605013A project FM7 in FY 2020 for greater transparency.					
Title: Family Advocacy System of Records (FASOR) ***Description:*** FASOR is the information system used by the Army to manage child and adult based abuse incidents referred by the Family Advocacy Program (FAP). FASOR is used to capture/perform incident case management and allows for standardization of reviews and incident determinations. FASOR is a key system used in FAP Army Central Registry (ACR) background checks when determining suitability of individuals to be placed into "positions of trust". Finally, FASOR facilitates reporting and data analysis in support of internal, Army, DoD, FOIA and Congressional requirements. ***FY 2019 Plans:***	-	1.914	-	-	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Continued research and development for modernization and compliance requirements to start in FY 2019. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding was transferred to project FM7 in FY 2020 for greater transparency.					
Title: HRC IT (iPERMS, iPERMS-S, ASBS 2.0, SMS WEB) ***Description:*** This program supports efforts to plan, design, develop, and test Information Technology (IT) solutions to fulfill the Army's Warfighter Support Mission, accommodate emerging Army requirements, and fulfill Future Army needs. Ongoing development efforts support multiple functional areas including logistics, personnel, transportation, training, medical/health protection, and the sustaining base. The focus of the rationalization effort is to identify value-added applications capable of serving a broader Army enterprise audience and garnering efficiencies through the elimination of outdated, legacy, and duplicative applications. Applications are upgraded or enhanced to meet compliance with Army Common Operating Environment standards in accordance with Army Application Management Business Office (AAMBO). Additionally, program supports enhancements and modifications to the Interactive Personnel Electronic Records Management System (iPERMS) and iPERMS-Secure (iPERMS-S), as well as development of interfaces based upon emerging requirements, Cybersecurity, functionality and compliance with Army standards. ***FY 2019 Plans:*** FY 2019 funding supports efforts to plan, design, develop, and test Information Technology (IT) solutions to fulfill the Army's Warfighter Support Mission, accommodate emerging Army requirements, and fulfill Future Army needs. Ongoing development efforts support multiple functional areas including logistics, personnel, transportation, training, medical/health protection, and the sustaining base. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Resources transferred to FM7 in FY 2020 for greater transparency.	3.407	2.801	-	-	-
Title: Army SHARP ***Description:*** Army SHARP Data Management System (DMS) Integrated Case Reporting System (ICRS) enhancements will provide stabilization for sexual harassment (SH) data collection, reporting requirements, and analytic processes. ICRS maintains Army sexual assault (SA) legacy data collected prior to 2014 in the Sexual Assault Data Management System (SADMS) in accordance with public law.	-	0.639	-	-	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
This effort transitions to 0605013A project FM7 in FY 2020 for greater transparency. ***FY 2019 Plans:*** Enable Army leaders at all levels to manage ICRS data through E-Document Format and documents upload capabilities within ICRS. Increase data element in ICRS and complete the Sexual Assault Data Management (SADMS) integration of data into ICRS. Support Advanced Analytics capabilities, increase business intelligence capabilities, and support predictive analysis for SHARP Data. Automate SHARP ICRS Reporting capabilities and facility integration of EORS system in to ICRS. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This effort transitions to 0605013A project FM7 in FY 2020 for greater transparency.					
Title: Criminal Information Management System (CIMS) ***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.	4.186	-	-	-	-
Title: Global Force Information Management ***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). ***FY 2020 Base Plans:***	-	-	2.933	-	2.933

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase in FY 2020 funding will continue the acquisition planning and systems engineering process.					
Title: Army Training Information System (ATIS) ***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. ***FY 2019 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). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding moved to Project FM8 starting in FY 2020 for greater transparency.	11.244	9.974	-	-	-
Title: SFL-TAP XXI Modernization ***Description:*** SOLDIER FOR LIFE-TRANSITION ASSISTANCE PROGRAM XXI (SFL-TAP XXI): The Transition Assistance Program XXI (TAP-XXI) application provides an interactive, multimedia approach to pre-separation counseling and job assistance training. This application uses full motion video, graphics, and sound to train clients; and schedules clients for classroom-type instruction. It integrates a complete range of transition services and benefits for service members, Department of Defense civilian employees, and their family members as they transition from the military. TAP-XXI is a web-based, three-tiered application with a centralized database for all Transition sites. The user interface is browser-based, the application is based on a storefront intranet model to provide access from within Transition centers. The requirements in place today represent a 300 percent increase over the pre-VOW requirements. A significant modernization effort within TAP XXI is needed. Justification: ($ in Millions) FY2019 Base procurement dollars in the amount of $0.606 million resources the TAP	-	0.972	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T05 / *Army Business System Modernization Initiatives*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
XXI modernization requirements. Planned Program includes modernize client management module, Soldier module, and increase reporting capabilities. ***FY 2019 Plans:*** FY 2019 funding will support modernization requirements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Resources transferred to FM7 in FY 2020 for greater transparency.					
Title: Army Career Tracker (ACT) ***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. ***FY 2019 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This effort transitions to 0605013A project FM8 in FY 2020 for greater transparency.	0.960	0.698	-	-	-
Title: Defense Language Software Upgrade ***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	1.286	1.028	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T05 / *Army Business System Modernization Initiatives*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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. ***FY 2019 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** This effort transitions to 0605013A project FM8 in FY 2020 for greater transparency.					
Title: Commanders Risk Reduction Dashboard (CRRD) ***Description:*** The Commanders Risk Reduction Dashboard (CRRD) requirements will be moved to and maintained within PE 0605013A, Project 099 in FY2019. 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. ***FY 2019 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 2019 to FY 2020 Increase/Decrease Statement:*** The Commanders Risk Reduction Dashboard (CRRD) requirements will be moved to and maintained within PE 0605013A, Project 099 in FY 2020.	1.600	3.744	-	-	-
Title: Army Business System Modernization Initiatives	7.659	3.940	3.041	-	3.041

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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 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.					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** T05 / *Army Business System Modernization Initiatives*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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 2019 Plans:*** Continue to fund Army Business System Modernization Initiatives. ***FY 2020 Base Plans:*** Continue to fund Army Business System Modernization Initiatives. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Reduction reflects current requirements.					
Title: Army Software Marketplace (ASM) ***Description:*** ASM will enable the Army to have a centralized location to store software applications and application metadata.	2.585	-	-	-	-
Title: FY 2019 SBIR / STTR Transfer ***Description:*** FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer	-	1.313	-	-	-
Accomplishments/Planned Programs Subtotals	34.355	27.790	5.974	-	5.974

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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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.

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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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GFIM will leverage existing Force Management System Cost Plus Fixed Fee contract to execute development efforts.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SFL-TAP XXI Modernization	TBD	To Be Determined : To Be Determined	-	-		0.639		-		-		-	Continuing	Continuing	Continuing
		Subtotal	-	-		0.639		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total 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	23.334	1.417		0.730		0.989		-		0.989	Continuing	Continuing	Continuing
Product Development for ACWS	C/IDIQ	PEO EIS : Alexandria, VA	45.741	-		-		-		-		-	Continuing	Continuing	Continuing
ATIS	C/IDIQ	PEO EIS : FT Eustice VA	24.508	11.244		9.974		-		-		-	Continuing	Continuing	Continuing
CRRD	C/IDIQ	TBD : TBD	0.627	1.600		3.744		-		-		-	Continuing	Continuing	Continuing
The Army Safety and Health Management System	C/IDIQ	TBD : TBD	8.225	-		-		-		-		-	Continuing	Continuing	-
Army Career Tracker	C/FFP	IBM : Reston, VA	1.328	0.960		0.698		-		-		-	Continuing	Continuing	-
Army Business System Modernization Initiatives	C/IDIQ	TBD : TBD	21.397	6.242		5.124		2.052		-		2.052	Continuing	Continuing	-
CIMS	C/IDIQ	ACC : NCR	2.170	4.186		-		-		-		-	Continuing	Continuing	Continuing
Educational Outreach Initiative:	C/IDIQ	DFSC : FT Gillem	0.156	-		-		-		-		-	0.000	0.156	-
Research & Development Identified through	C/IDIQ	DFSC : Ft Gillem	2.340	-		-		-		-		-	0.000	2.340	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) T05 / *Army Business System Modernization Initiatives*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
the Broad Agency Announcement Initiative															
Defense Language Software Upgrade	C/FFP	TBD : TBD	2.524	1.286		1.028		-		-		-	Continuing	Continuing	Continuing
Army Software Marketplace (ASM)	TBD	PEO EIS : Fort Belvoir, VA	-	2.585		-		-		-		-	0.000	2.585	-
Global Force Information Management	Option/ CPFF	CACI : Chantilly, VA	-	-		-		2.933		-		2.933	Continuing	Continuing	Continuing
Army SHARP	TBD	Various : Various	-	-		0.639		-		-		-	Continuing	Continuing	Continuing
SFL-TAP XXI Modernization	TBD	To Be Determined : To Be Determined	-	-		0.333		-		-		-	Continuing	Continuing	Continuing
HRC Core IT	C/CPFF	Digital Management, LLC / SAIC : Bethesda, MD / Reston, VA	-	3.407	Aug 2018	2.801		-		-		-	Continuing	Continuing	Continuing
ARIMS	TBD	TBD : TBD	-	1.428		0.767		-		-		-	Continuing	Continuing	Continuing
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		1.313		-		-		-	0.000	1.313	-
		Subtotal	148.920	34.355		27.151		5.974		-		5.974	Continuing	Continuing	N/A

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 (GFM-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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract

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).

HRC Core IT: Award date shown reflects iPERMS IT Integration Contract. SMS-WEB and ASBS 2.0 are on the Digital Application Support Task Order (DASTO) with an award date of 6 Feb 18.

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.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IPPS-A SUPPORT COSTS	MIPR	HRC : FORT KNOX, KY	15.357	-		-		-		-		-	0.000	15.357	-
HRC SYSTEMS KEYSTONE, IPERMS	MIPR	HRC : FORT KNOX, KY	0.385	-		-		-		-		-	0.000	0.385	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Law Enforcement Advisory Program(LEAP)	MIPR	ACC/NCR : Quantico, VA	2.677	-		-		-		-		-	Continuing	Continuing	-
ARMY MAPPER	C/T&M	TBD : TBD	0.220	-		-		-		-		-	0.000	0.220	-
		Subtotal	18.639	-		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	167.559	34.355		27.790		5.974		-		5.974	Continuing	Continuing	N/A

Remarks

SFL-TAP has no additional changes from FY19-20

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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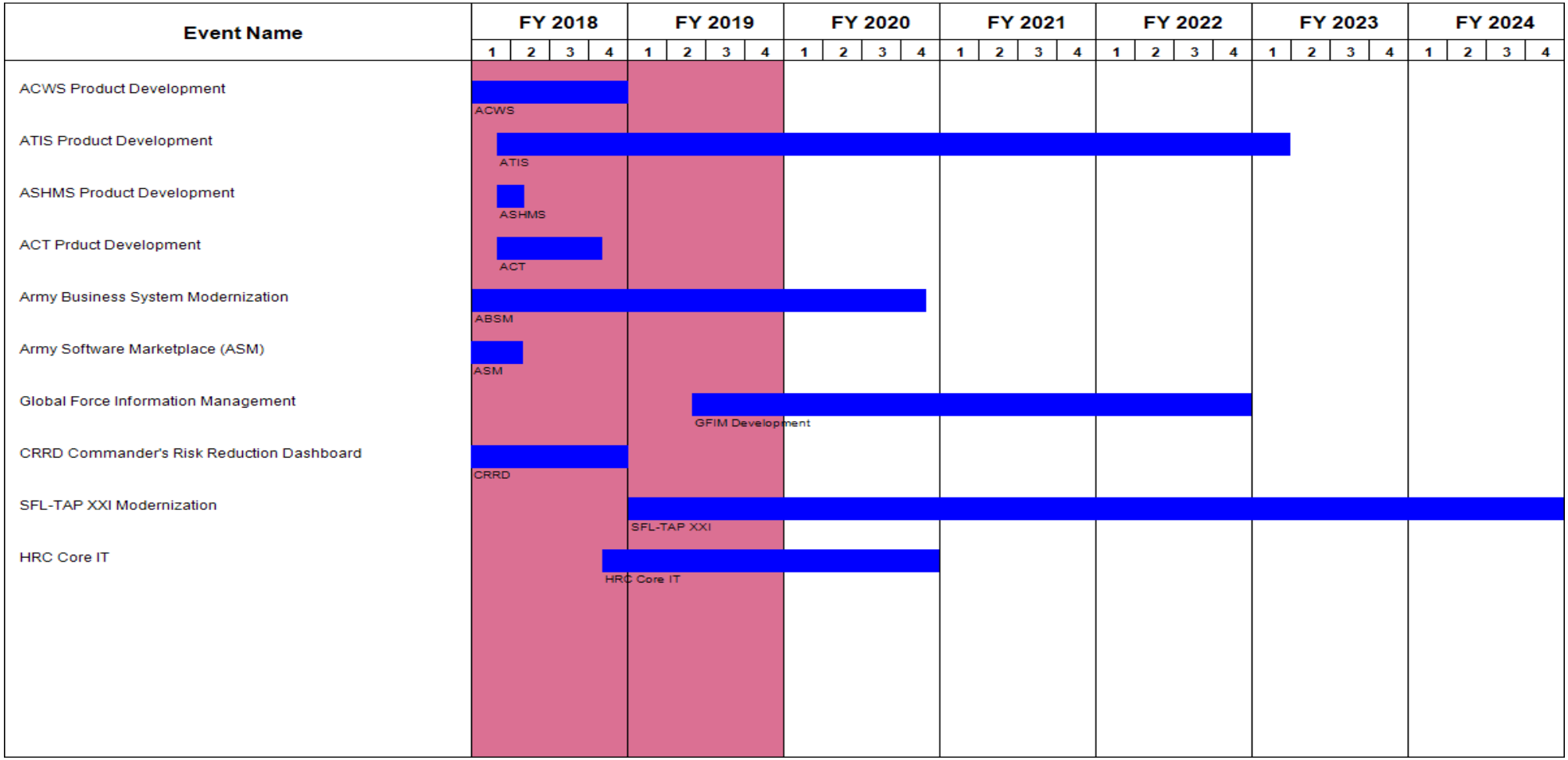

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
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Schedule Details

	Start		End	
Events	**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
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	2019	4	2022
CRRD Commander's Risk Reduction Dashboard	3	2015	4	2018
SFL-TAP XXI Modernization	1	2019	4	2024
HRC Core IT	4	2018	4	2020

Note

Army Contract Writing System moved to 0605047 in FY 2017. The Commanders Risk Reduction Dashboard (CRRD) requirements moved to and are now maintained within PE 0605013A, Project 099 in FY2019.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
VR3: *ASMIS-R (REPORTIT)*	-	3.455	1.966	3.095	-	3.095	3.159	3.222	3.268	3.301	0.000	21.466
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: ASMIS-R Development	3.455	1.869	3.095	-	3.095
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 ASA(ESOH) revealed a deficiency in the system's requirements that would support Army Commands in identifying hazards in the work place,					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** VR3 / *ASMIS-R (REPORTIT)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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 2019 Plans:*** FY 2019 funds are being used to continue development of ASMIS-R products and tools. ***FY 2020 Base Plans:*** Continue work with Army Analytics Group and contract for the development of the fourth activity. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase in funding for the fourth activity.					
Title: FY 2019 SBIR / STTR Transfer ***Description:*** FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer	-	0.097	-	-	-
Accomplishments/Planned Programs Subtotals	3.455	1.966	3.095	-	3.095

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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 2024.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) VR3 / *ASMIS-R (REPORTIT)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ASMIS-R	MIPR	AAG : Monterrey, CA	-	0.434		0.426		0.395		-		0.395	Continuing	Continuing	Continuing
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.097		-		-		-	0.000	0.097	-
		Subtotal	-	0.434		0.523		0.395		-		0.395	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ASMIS-R	TBD	Army Contracting Command : Natick	-	3.021	Jun 2018	1.443	Dec 2018	2.700		-		2.700	Continuing	Continuing	Continuing
		Subtotal	-	3.021		1.443		2.700		-		2.700	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.455		1.966		3.095		-		3.095	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** VR3 / *ASMIS-R (REPORTIT)*

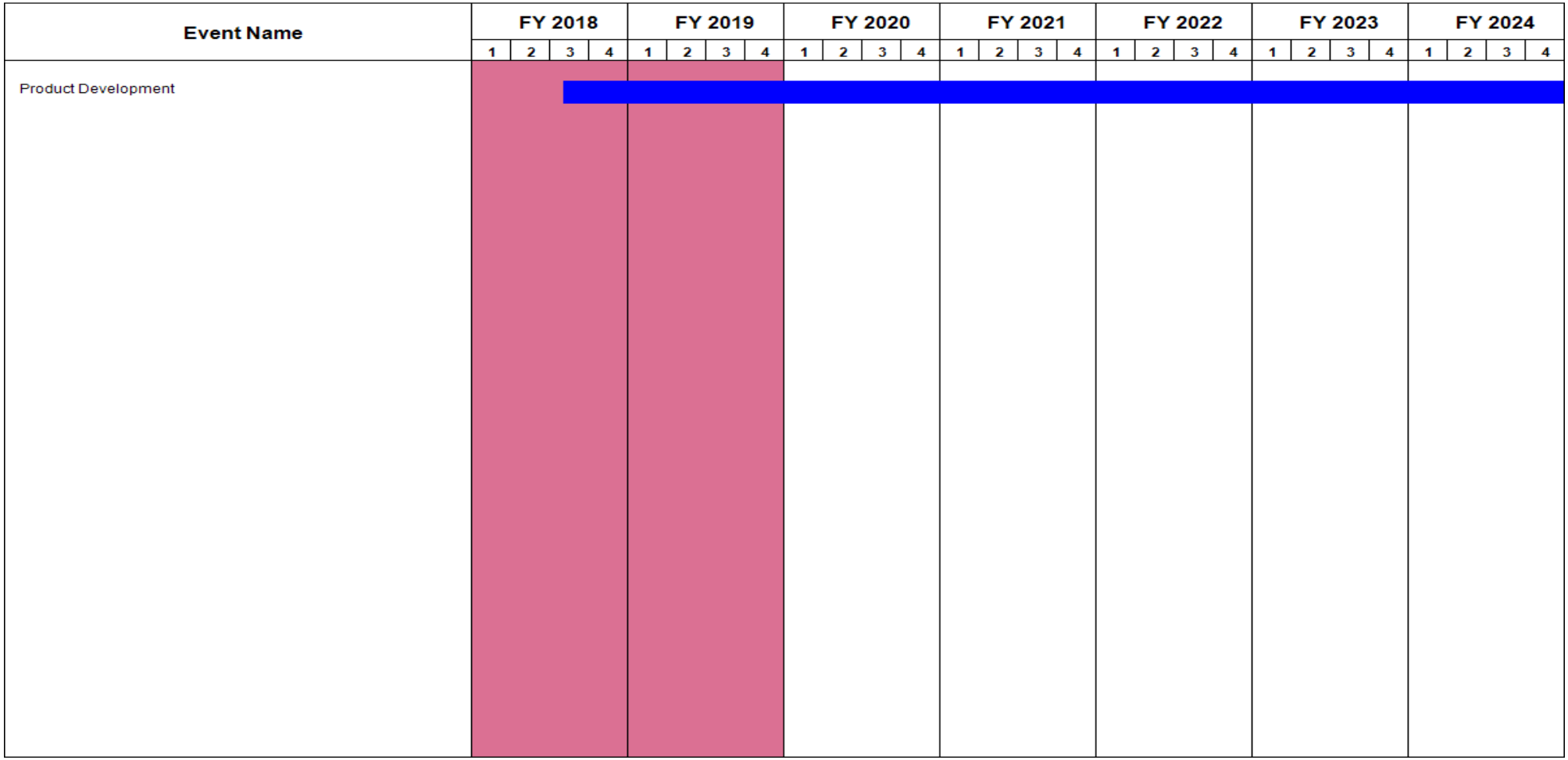

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** VR3 / *ASMIS-R (REPORTIT)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Product Development	3	2018	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605013A / *Information Technology Development*	Project (Number/Name) XV6 / *Army Leader Dashboard*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
XV6: *Army Leader Dashboard*	-	0.000	0.000	1.479	-	1.479	1.508	1.539	1.538	1.601	0.000	7.665
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program is not a new start. On 10 May 2018 and ATR was approved by the HAC-D for $7.4M (FY17 RDT&E) used in FY18 to award an Other Transaction Agreement to 5 vendors and to complete Phase 1 Prototyping (funding Line - 655013).In addition, ABO funded the ALD program with $9.575M (FY19 RDT&E) to fund Phase 2 Prototyping efforts in FY19.

A. Mission Description and Budget Item Justification

Funding supports the Army Leader Dashboard, a large data management platform-like and tailorable solution that integrates, analyzes, and visualizes information from multiple disparate data sources, both classified and unclassified. Information relayed by the system will include timely, precise, and accurate reports and indicators for readiness, manning, equipping, training, sustainment, acquisition, and cyber security capabilities at all levels from the individual Soldier or item, to unit levels, and to the strategic level.

ALD will provide Army leaders near real-time visibility and access to Army data sources, facilitating rapid decision making while supporting strategic, operational, and tactical planning. ALD is one of the CSA's top priorities and is endorsed by senior leaders throughout the Army.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Army Leader Dashboard Acquisition, Testing and Deployment Phase	-	-	1.479	-	1.479
Description: During the Acquisition, Testing, and Deployment Phase the ALD program will perform all development, data integration, test, and deployment activities of a dashboard solution that will enable Army Senior leaders and leaders at designated levels to easily navigate through information from multiple Army Authoritative Data Sources (ADS?s) in order to capture information to produce predictive analytics and facilitate real-time or near real-time decision making.					
FY 2020 Base Plans: Funding will support the Phase 3 Production phase, specifically on external interface partner integration and development. To date, a potential of 697 authoritative data sources have been identified that will require some sort of connection to ALD.					
FY 2019 to FY 2020 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** XV6 / *Army Leader Dashboard*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Program is not a new start. On 10 May 2018 and ATR was approved by the HAC-D for $7.4M (FY17 RDT&E) used in FY18 to award an Other Transaction Agreement to 5 vendors and to complete Phase 1 Prototyping (funding Line ? 655013).In addition, ABO funded the ALD program with $9.575M (FY19 RDT&E) to fund Phase 2 Prototyping efforts in FY19. FY20 funding supports the Production phase, specifically external interface partner integration and development of Authoritative Data Source systems.					
Accomplishments/Planned Programs Subtotals	-	-	1.479	-	1.479

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Army Leader Dashboard (ALD) has also been allocated OMA dollars in FY20 to fund the Phase 3 Production phase as a Software as a Service (SaaS). The OMA dollars will maintain the selected system - licenses, helpdesk hosting, cybersecurity, and all supporting sustainment activity requirements.

D. Acquisition Strategy

In Section 815 of the National Defense Authorization Act (NDAA) for FY16, Public Law 114-92, Congress amended DoD's authority to carry out prototype projects using Other Transaction (OT) agreements. OT agreements are now permanently codified in 10 U.S.C. Section 2371b, titled "Authority of the Department of Defense to Carry out Certain Prototype Projects" and offer a streamlined method for selecting and conducting prototype projects. The ALD Team is taking advantage of this useful acquisition tool to procure ALD prototypes rapidly. Section 2371b requires that competitive procedures be used "to the maximum extent practicable," and the ALD is using a "full and open" Prototype Proposal Opportunity Notice (PPON) to achieve maximum competition.

In addition to the system functional requirements, a directed needs statement directs the program to:
* Procure no less than two, and not more than four, prototypes for user assessment, development of application protocol interfaces, and development of selected software interfaces with designated Authoritative Data Sources.
* Phase the program to deliver an initial capability of two to four prototypes no later than 30 days (from award announcement) that allows assessment of the awarded two to four prototypes and a final comparison tradeoff. The results will lead to a follow-on award of one to two prototypes for an additional assessment phase upon execution of a Decision Point.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** XV6 / *Army Leader Dashboard*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
External Interface Partner Integration	TBD	TBD : TBD	-	-		-		1.479	Jan 2020	-		1.479	0.000	1.479	Continuing
		Subtotal	-	-		-		1.479		-		1.479	0.000	1.479	N/A

Remarks

The interface development approach for ALD will be informed by the Studies & Analysis requirement during the Phase 1 Prototyping Stage in FY18/FY19.

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		1.479		-		1.479	0.000	1.479	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** XV6 / *Army Leader Dashboard*

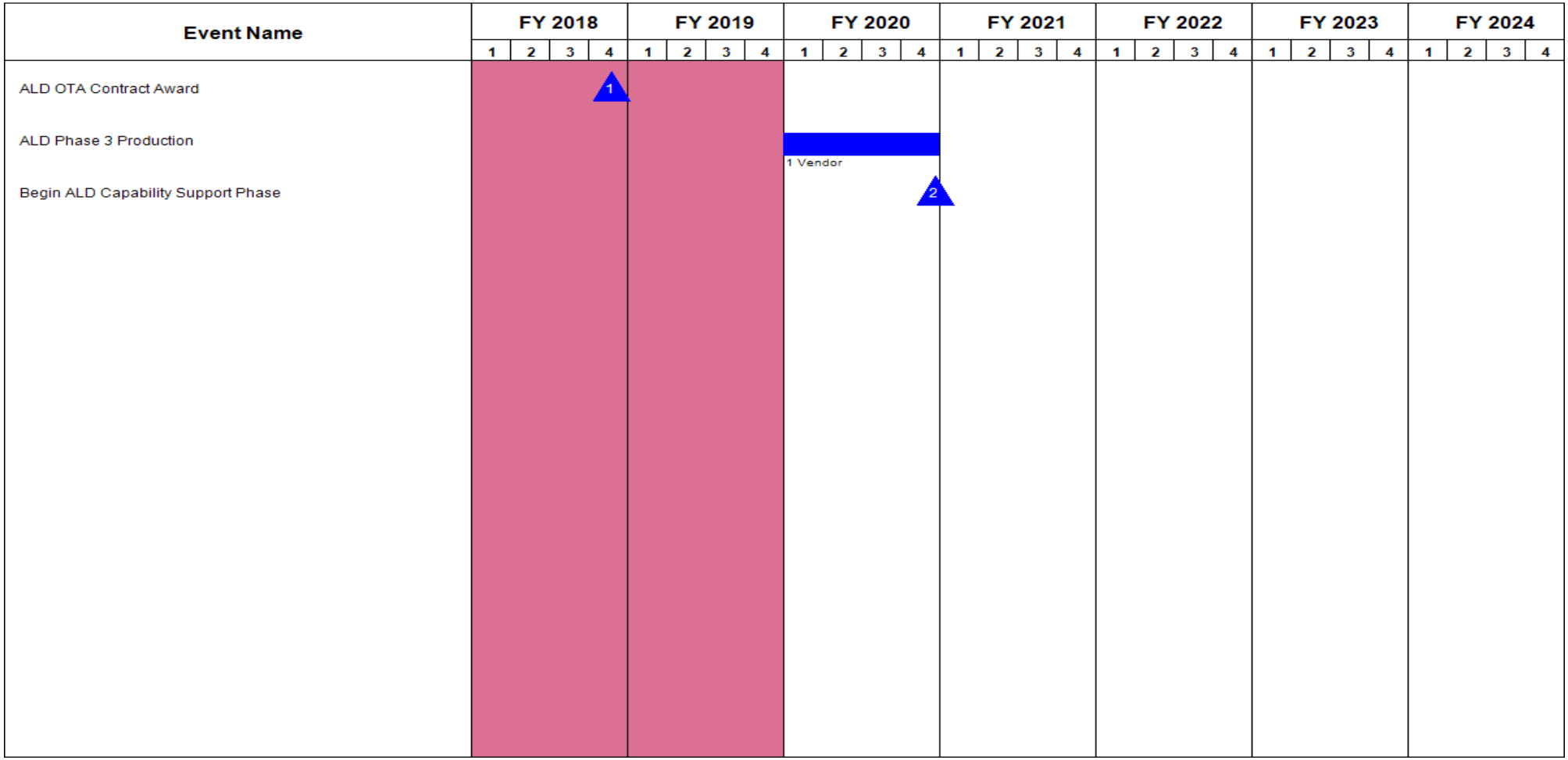

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605013A / *Information Technology Development*	**Project (Number/Name)** XV6 / *Army Leader Dashboard*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
ALD OTA Contract Award	4	2018	4	2018
ALD Phase 3 Production	1	2020	4	2020
Begin ALD Capability Support Phase	4	2020	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605018A *I Integrated Personnel and Pay System-Army (IPPS-A)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	188.637	164.899	142.773	-	142.773	66.045	1.466	0.000	0.000	Continuing	Continuing
ED9: *Integrated Personnel and Pay System - Army Inc 2*	-	188.637	164.899	142.773	-	142.773	66.045	1.466	0.000	0.000	Continuing	Continuing

Note

IPPS-A Increment II (Project ED9), formerly designated as an Acquisition Category IA Major Automated Information System (MAIS) program under the authority of DoDI 5000.02, will transition under the acquisition authority of DoDI 5000.75 as a Business System Category I (BSC 1) program. The program will be officially designated as a BSC I at the next major Milestone decision, which is Release 2 Limited Deployment Authority to Proceed.

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 (full and partial) 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. This program is an essential building block to reform the Department towards achieving greater performance and affordability in support of the National Defense Strategy as well as Congressional auditability mandate.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	172.361	166.603	38.853	-	38.853
Current President's Budget	188.637	164.899	142.773	-	142.773
Total Adjustments	16.276	-1.704	103.920	-	103.920
• Congressional General Reductions	-0.141	-0.204			
• Congressional Directed Reductions	-	-1.500			
• Congressional Rescissions	-	-			
• Congressional Adds	17.383	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	5.781	-			
• SBIR/STTR Transfer	-6.747	-			
• Adjustments to Budget Years	-	-	103.920	-	103.920

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605018A *I Integrated Personnel and Pay System-Army (IPPS-A)*

Change Summary Explanation

FY2020 RDTE increase of $103.920 million supports revised Increment II schedule providing for development of Release 3 (Personnel System for Reserves and Active Duty). IPPS-S Increment II Release 2, currently in operational Limited User Test, required more resources than projected for FY2019.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
ED9: *Integrated Personnel and Pay System - Army Inc 2*	-	188.637	164.899	142.773	-	142.773	66.045	1.466	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

IPPS-A Increment II (Project ED9), formerly designated as an Acquisition Category IA Major Automated Information System (MAIS) program under the authority of DoDI 5000.02, will transition under the acquisition authority of DoDI 5000.75 as a Business System Category I (BSC 1) program. The program will be officially designated as a BSC I at the next major Milestone decision, which is Release 2 Limited Deployment Authority to Proceed.

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 2018	FY 2019	FY 2020
Title: Analysis and Design, Development, and Integration of IPPS-A Increment II	188.637	158.807	142.773
Description: Requested funding provides for the following: procurement and maintenance of software licenses, engineering support for product development and system integration, data center hosting, testing and evaluation, and program management services.			
FY 2019 Plans: IPPS-A will complete all testing requirements leading to Limited Fielding Decision for Release 2.0. IPPS-A will begin all critical activities to complete system design, configuration, development and integration for Release 3.0.			
FY 2020 Plans: IPPS-A will complete all testing activities leading to Authority To Proceed for Release 3.0 Limited Deployment. IPPS-A will complete all critical activities concerned with final Testing and Validation including Developmental Integration Testing, Government Acceptance Testing and Operational Testing.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
The total decrease of $16.034 million from FY 2019 to FY 2020 supports the revised Increment II schedule of less concurrency development in FY 2020 (Releases 3.0 and 4.0) compared to FY 2019 (Releases 2.0, 3.0 and 4.0).			
Title: FY 2019 SBIR / STTR Transfer ***Description:*** FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer	-	6.092	-
Accomplishments/Planned Programs Subtotals	188.637	164.899	142.773

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• B66706: *IPPS-A INC 2*	16.140	16.800	18.674	-	18.674	12.176	9.880	-	-	Continuing	Continuing

Remarks

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 66,000 personnel for Increment II. 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 (Project ED9), formerly designated as an Acquisition Category IA Major Automated Information System (MAIS) program under the authority of DoDI 5000.02, will transition under the acquisition authority of DoDI 5000.75 as a Business System Category I (BSC 1) program. The program will be officially designated as a BSC I at the next major Milestone decision, which is Release 2 Limited Deployment Authority to Proceed. IPPS-A 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. Increment II revised schedule will consists of three releases (2.0-4.0). Each release will build upon the previous release, providing pre-defined personnel and/or pay capabilities. IPPS-A is post Milestone (MS) B (14 December 2014) and have achieved Authorization To Proceed (ATP) for Releases 2 and 3 and working towards ATP for Release 4. Each release will 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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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*

Release 2.0-Standard Installation/Division Personnel System (SIDPERS): Began in FY 2015 and delivers capability in FY 2019 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: Began in FY 2017 and delivers capability in FY 2020 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 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.

Release 4.0-Pay Services: Will begin in FY 2018 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. As a part of the on-going efforts to revise the Increment II schedule, the former Release 5.0 capabilities have been reorganized under various Pre-Planned Product Improvements post Full Deployment as "dot-release." These dot-releases will occur post FY 2021.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total 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	13.471	4.070	Jun 2018	6.514	Jun 2019	6.514	Jun 2020	-		6.514	Continuing	Continuing	Continuing
In-House Government Management Support	Allot	Program oversight, resource justification, budget and programming, milestone and schedule tracking : NCR	11.891	3.955	Apr 2018	0.818	Apr 2019	0.600	Apr 2020	-		0.600	Continuing	Continuing	Continuing
		Subtotal	25.362	8.025		7.332		7.114		-		7.114	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software License -All Others	C/FFP	Various : Various	7.920	3.518	Jan 2018	3.169	Jan 2019	2.315	Jan 2020	-		2.315	Continuing	Continuing	Continuing
Software Licenses - IBM	C/FFP	Immixtechnology INC : McLean, Va	1.701	1.075	Jan 2018	0.335	Jan 2019	-		-		-	0.000	3.111	-
Software Licenses - GRC	C/FFP	Mythics : Virginia Beach, VA	2.876	1.098	Jun 2018	0.922	Jun 2019	-		-		-	0.000	4.896	-
Software Ab Initio	C/FFP	Various : Various	2.948	0.206	Mar 2018	1.067	Mar 2019	0.803	Mar 2020	-		0.803	Continuing	Continuing	Continuing
Oracle Bundle - Software	SS/FFP	Oracle America INC : Reston, VA	17.649	2.463	May 2018	2.271	May 2019	-		-		-	0.000	22.383	-
Oracle - ULA	C/FFP	Myhtics : Virginia Beach, VA	3.752	3.393	May 2018	1.960	May 2019	0.878	May 2020	-		0.878	Continuing	Continuing	Continuing
Software Licenses- CA	SS/FFP	Immix Tech : McLean, VA	0.859	-		-		-		-		-	0.000	0.859	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Licenses -ESB	SS/FFP	Actuate Corp : San Mateo, CA	3.281	0.469	Jul 2018	0.405	Jul 2019	0.450	Jul 2020	-		0.450	Continuing	Continuing	Continuing
Software Product Level SME Consulting Support	SS/FFP	Various : Various	8.902	3.549	May 2018	1.132	May 2019	1.189	May 2020	-		1.189	Continuing	Continuing	Continuing
in House contract support of system development	C/CPFF	Various : Various	44.644	16.390	May 2018	17.087	May 2019	17.500	May 2020	-		17.500	Continuing	Continuing	Continuing
Functional in house contract support of system development-Army National Guard/Army Reserve/FMD	C/FFP	BAH : NCR	11.383	-		-		-		-		-	0.000	11.383	-
Design, Developmentand Integration - Increment II	C/CPIF	CACI : Chantilly, VA	112.375	77.653	May 2018	67.700	May 2019	63.173	May 2020	-		63.173	Continuing	Continuing	Continuing
Network Support/ Production Hosting Services/Hardware Leasing	MIPR	Defense Information Systems Agency (DISA) Defense Enterprise Computing Center (DECC) : various	52.303	39.923	May 2018	31.108	May 2019	23.500	May 2020	-		23.500	Continuing	Continuing	Continuing
Software Licenses -m Factory C	C/FP	ACC -NJ : New Jersey	1.551	0.255	Aug 2018	0.264	Aug 2019	0.242	Aug 2020	-		0.242	Continuing	Continuing	Continuing
Software Licenses- PeopleSoft Enterprise Licenses	C/FFP	PeopleSoft : Pleasanton, CA	3.498	1.248	Nov 2017	-		-		-		-	0.000	4.746	-
Systems Interfaces	C/ FFPLOE	FMS, DMDC, GFEBS, HRC : Various Locations	3.766	5.236	Jul 2018	8.204	Jul 2019	7.800	Jul 2020	-		7.800	Continuing	Continuing	Continuing
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		6.092		-		-		-	0.000	6.092	-
		Subtotal	279.408	156.476		141.716		117.850		-		117.850	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army		Date: March 2019
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*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Facilities/Lease/Rents	MIPR	Facilities/Leases/ Rents : Various	12.217	5.220	Oct 2017	5.800	Oct 2018	3.909	Oct 2019	-		3.909	Continuing	Continuing	Continuing
Equipment and Supplies MISC	Various	Various : Various	4.100	1.143	May 2018	0.984	May 2019	0.500	May 2020	-		0.500	Continuing	Continuing	Continuing
		Subtotal	16.317	6.363		6.784		4.409		-		4.409	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Increment II-Government Acceptance Testing/ Operational Test and Evaluation	MIPR	Various Government Agencies : Various	2.937	8.416	Oct 2017	7.000	Oct 2018	9.100	Oct 2019	-		9.100	Continuing	Continuing	Continuing
Increment II - Capability Acceptance Testing (CAT) /DT	Various	Government & Support Contractors : Various	4.712	9.357	Oct 2017	2.067	Oct 2018	4.300	Oct 2019	-		4.300	Continuing	Continuing	Continuing
		Subtotal	7.649	17.773		9.067		13.400		-		13.400	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	328.736	188.637		164.899		142.773		-		142.773	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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*

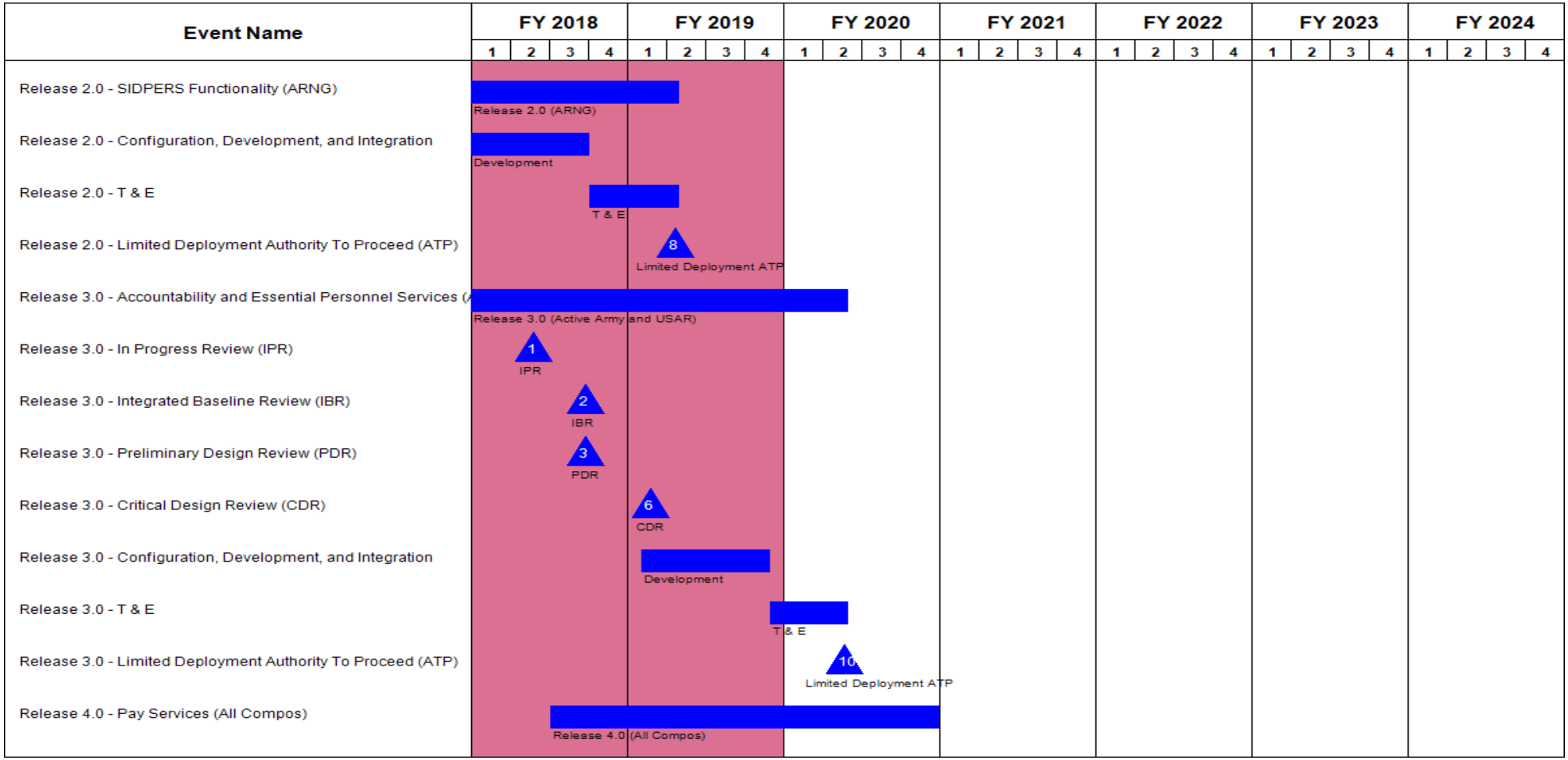

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605018A / *Integrated Personnel and Pay System-Army (IPPS-A)*	**Project (Number/Name)** ED9 / *Integrated Personnel and Pay System - Army Inc 2*

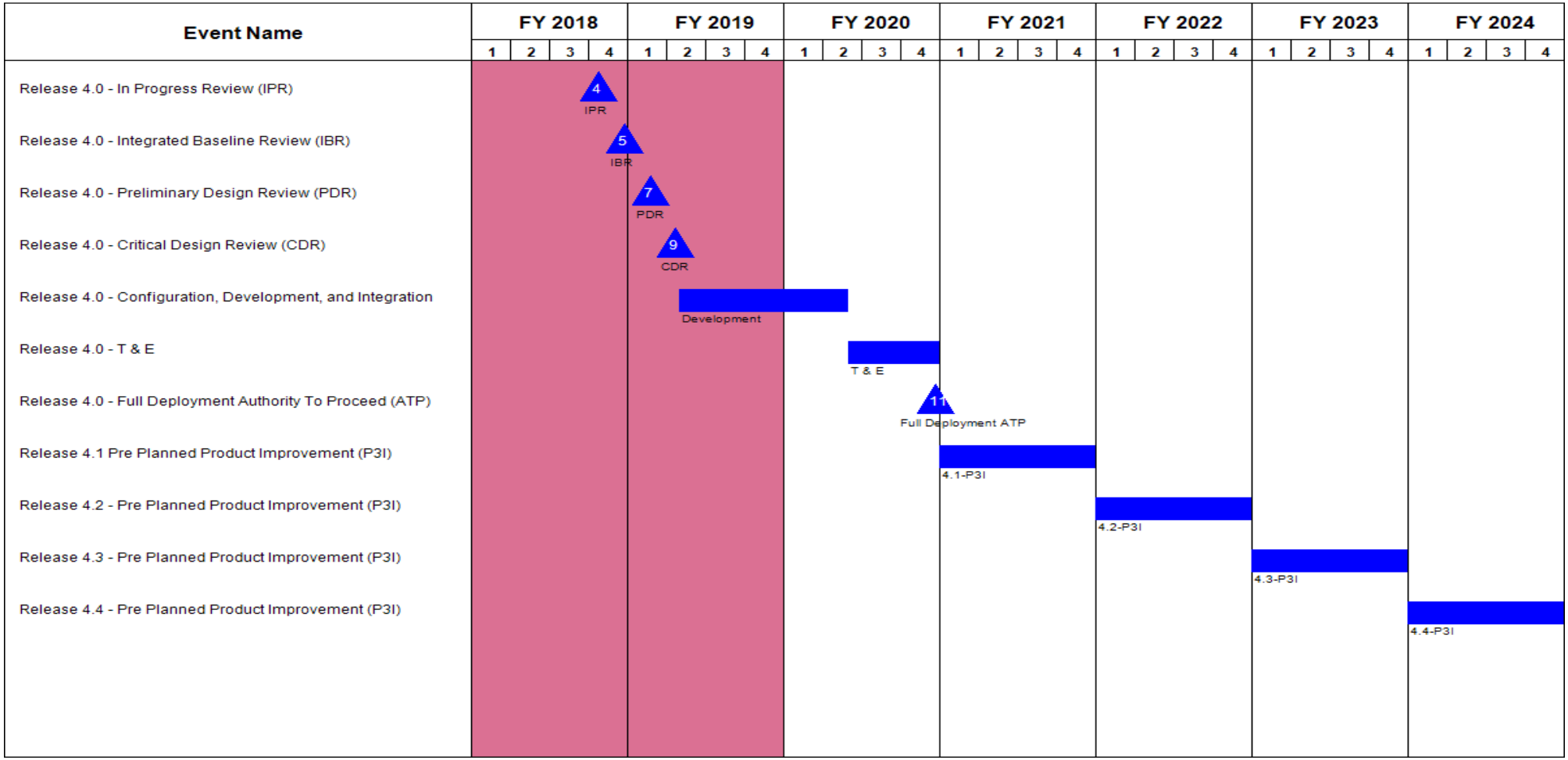

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605018A / *Integrated Personnel and Pay System-Army (IPPS-A)*	**Project (Number/Name)** ED9 / *Integrated Personnel and Pay System - Army Inc 2*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Release 2.0 - SIDPERS Functionality (ARNG)	4	2015	2	2019
Release 2.0 - Configuration, Development, and Integration	3	2017	3	2018
Release 2.0 - T & E	4	2018	2	2019
Release 2.0 - Limited Deployment Authority To Proceed (ATP)	2	2019	2	2019
Release 3.0 - Accountability and Essential Personnel Services (Active and AR)	4	2017	2	2020
Release 3.0 - In Progress Review (IPR)	2	2018	2	2018
Release 3.0 - Integrated Baseline Review (IBR)	3	2018	3	2018
Release 3.0 - Preliminary Design Review (PDR)	3	2018	3	2018
Release 3.0 - Critical Design Review (CDR)	1	2019	1	2019
Release 3.0 - Configuration, Development, and Integration	1	2019	4	2019
Release 3.0 - T & E	4	2019	2	2020
Release 3.0 - Limited Deployment Authority To Proceed (ATP)	2	2020	2	2020
Release 4.0 - Pay Services (All Compos)	3	2018	4	2020
Release 4.0 - In Progress Review (IPR)	4	2018	4	2018
Release 4.0 - Integrated Baseline Review (IBR)	4	2018	4	2018
Release 4.0 - Preliminary Design Review (PDR)	1	2019	1	2019
Release 4.0 - Critical Design Review (CDR)	2	2019	2	2019
Release 4.0 - Configuration, Development, and Integration	2	2019	2	2020
Release 4.0 - T & E	2	2020	4	2020
Release 4.0 - Full Deployment Authority To Proceed (ATP)	4	2020	4	2020
Release 4.1 Pre Planned Product Improvement (P3I)	1	2021	4	2021
Release 4.2 - Pre Planned Product Improvement (P3I)	1	2022	4	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
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*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Release 4.3 - Pre Planned Product Improvement (P3I)	1	2023	4	2023
Release 4.4 - Pre Planned Product Improvement (P3I)	1	2024	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army												Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605028A / *Armored Multi-Purpose Vehicle (AMPV)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	184.300	111.821	96.730	-	96.730	96.687	0.000	0.000	0.000	0.000	489.538
EB5: *Armored Multi-Purpose Vehicle*	-	184.300	111.821	96.730	-	96.730	96.687	0.000	0.000	0.000	0.000	489.538

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 (TAC) Vehicle 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 litters 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 was initiated with 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). A subsequent ADM was issued on 26 September 2017 and it approved: a revised acquisition documentation tailoring plan, revised Milestone C entrance criteria, and an increase in the Low Rate Initial Production (LRIP) quantity to 551 vehicles (to recognize the Army's desire for early fielding of AMPVs for the European Deterrence Initiative). An ADM was then issued on 1 November 2017 and it delegated Milestone Decision Authority to the Secretary of the Army and re-designated AMPV as an Acquisition Category (ACAT) IC program. The FY2020 planned program primarily consists of initiation of Production Qualification Testing (PQT), Initial Operational Test & Evaluation (IOTE) planning, and the initiation of the Production and Deployment phase Live Fire Test and Evaluation (LFT&E). Prime contractor support will be required for testing and engineering and ensure adequate system support packages will be available during the tests. Government test locations will be used for the tests and government personnel will be responsible for the overall management of the efforts. An Army Systems Acquisition Review Council (ASARC) took place on December 20, 2018 with the Army Acquisition Executive (AAE) and the Vice Chief Staff of the Army (VCSA). The meeting resulted in the approval of the AMPV to enter MS C and LRIP.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army					Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605028A / *Armored Multi-Purpose Vehicle (AMPV)*		
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	199.778	118.239	92.730	-	92.730
Current President's Budget	184.300	111.821	96.730	-	96.730
Total Adjustments	-15.478	-6.418	4.000	-	4.000
• Congressional General Reductions	-0.152	-0.139			
• Congressional Directed Reductions	-8.000	-6.279			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-7.326	-			
• Adjustments to Budget Years	-	-	4.000	-	4.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EB5: *Armored Multi-Purpose Vehicle*	-	184.300	111.821	96.730	-	96.730	96.687	0.000	0.000	0.000	0.000	489.538
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This program supports the Cross Functional Team (CFT).

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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Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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*

support packages will be available during the tests. Government test locations will be used for the tests and government personnel will be responsible for the overall management of the efforts. An Army Systems Acquisition Review Council (ASARC) took place on December 20, 2018 with the Army Acquisition Executive (AAE) and the Vice Chief Staff of the Army (VCSA). The meeting resulted in the approval of the AMPV to enter MS C and LRIP.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Armored Multi-Purpose Vehicle (AMPV) Product Development	129.031	71.292	62.085	-	62.085
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. ***FY 2019 Plans:*** Prime contractor activities in FY2019 consisted of efforts that supported the Engineering and Manufacturing Development (EMD) contract. The contractor provided support 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 were completed by the end of 1QFY2019. As required, the contractor analyzed the results of the testing program and incorporated any necessary design changes into selected prototypes. In addition to test support, the contractor completed a System Verification Review / Production Readiness Review (SVR/PRR) 1QFY2019. The SVR/PRR is 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). A final significant area of effort for the prime contractor during 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 (completed 1QFY2019), the program will exercise the existing					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
option for the first year of Low Rate Initial Production (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. ***FY 2020 Base Plans:*** Prime contractor activities in FY2020 consist of efforts that support Production Qualification Testing (PQT), the Production and Deployment phase Live Fire Test and Evaluation (LFT&E), Initial Operational Test and Evaluation (IOT&E) planning, and potential design efforts to address changes stemming from the tests and/or to satisfy other emerging Army requirements. PQT is scheduled to begin 2QFY2020 and is planned to conclude 3QFY2021. Prior to the start of testing, the contractor will conduct a system level 250 mile shakedown test of each of the Reliability, Availability, and Maintainability (RAM) vehicles. During the PQT, the contractor will provide test/engineering support and field service representatives at the Aberdeen Test Center (ATC), the Yuma Test Center (YTC), and at White Sands Missile Range (WSMR) as well as Electronic Proving Ground (EPG), Cold Regions Test Center (CRTC), Tropic Regions Test Center (TRTC), and Dugway Proving Grounds (DPG). In addition, the contractor will conduct Operator New Equipment Training (OPNET) and Field Level Maintenance New Equipment Training (FLMNET) prior to the start of PQT. This includes all necessary equipment and materials to conduct the training. Finally, as required, the contractor will maintain and replenish the System Support Packages (SSPs) needed to complete testing. The LFT&E effort is intended to satisfy the requirements of 10 U.S.C. 2366 (Major systems and munitions programs: survivability testing and lethality testing required before full-scale production). Two of each variant will be subject to the LFT&E and costs included in this element are the support costs provided by the AMPV prime contractor. As is the case for the PQT, the contractor will provide support personnel at the primary test location (Aberdeen Test Center). The goal is to return each vehicle to a near operational condition after each live fire shot. The contractor must ensure that system support packages include adequate spare and repair parts. As required, the contractor will support government personnel in repairing each vehicle prior to the subsequent shot. Costs in this element also include those contractor program management efforts necessary to oversee the above described activities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease is due to the program transition into the Low Rate Initial Production (LRIP) phase.					
Title: AMPV Government Program Management Costs	21.055	15.700	3.888	-	3.888

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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. ***FY 2019 Plans:*** Provided integrated program management for all development activities, to include providing oversight to BAE. Eight Integrated Product Teams (IPTs) continued 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 included review and acceptance of all formal contract deliverables and test reports. The AMPV Earned Value Management (EVM) team continued to evaluate cost and schedule performance against the established Performance Measurement Baseline (PMB) and Integrated Master Schedule (IMS). There are three overarching areas of emphasis for the Government Project Management team in FY2019: the EMD phase of the program, completion of the program level Milestone C (MS C), and initiation of Low Rate Initial Production (LRIP). For EMD, the team will participated in, and reviewed artifacts for, the System Verification Review/Production Readiness Review (SVR/PRR). In addition, the team ensured all EMD deliverables are in accordance with contract requirements and will support any other contract efforts. For Milestone C, the team finalized the required documents and will participate in meetings/reviews that lead to the actual review 2QFY2019. Related to LRIP, the team provided 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. ***FY 2020 Base Plans:*** Provide integrated program management for all development activities, to include providing oversight to BAE. The primary area of emphasis for the RDT&E funded Government Project Management team in FY2020 is to provide oversight to those Low Rate Initial Production (LRIP) activities that are traceable to Production Qualification Testing or Live Fire Test and Evaluation. All other Government Program Management efforts in support of LRIP will be covered by Procurement funding. Also, as required, the AMPV Government Project					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Management team may support Army assessment efforts that relate to the AMPV design possibly being used to satisfy other emerging Army requirements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease is due to the program transitioning from RDTE funded Program Management Support to Production funded Program Management Support.					
Title: Government Test Costs ***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. ***FY 2019 Plans:*** Government Test costs in FY2019 reflected the EMD testing, test data evaluation and reporting, and the commencement of test planning for Production Qualification Testing (PQT). All Developmental Testing (DT) will be completed 1-2QFY2019. This included Electromagnetic Interference (EMI) testing at the Electronic Proving Ground (EPG). System level Live Fire (LF) testing of prototypes (which started in FY2018) will likewise be completed in FY2019. The Limited User Test (LUT) was completed 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, detailed test planning for PQT (Performance and RAM) will take place and be finalized to support testing in FY2020. The Full-Up System Level (FUSL) live fire test planning efforts also commenced. Test ammunition and test threat management, forecasting, and procurement will continue for future test efforts. ***FY 2020 Base Plans:*** Government test costs in FY2020 are primarily related to Production Qualification Testing (PQT) and the Production and Deployment phase Live Fire Test and Evaluation (LFT&E). Both PQT and the LFT&E are scheduled to begin 3QFY2020 and will conclude 4QFY2021. Currently, a total of 25 vehicles will undergo Production Qualification Testing. As part of PQT, and in support of Reliability, Availability, and Maintainability (RAM) assessments, six vehicles will run a total of 14,000 miles. The miles will be equally split between	34.214	20.529	30.757	-	30.757

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
the Aberdeen Test Center (ATC) and the Yuma Test Center (YTC). An additional 19 vehicles will undergo performance testing as part of PQT. This testing will be performed at ATC, YTC, White Sands Missile Range (WSMR), Electronic Proving Ground (EPG), Cold Regions Test Center (CRTC), Tropic Regions Test Center (TRTC), and Dugway Proving Grounds (DPG). PQT is conducted with production-representative vehicles from LRIP. The objectives include verification that the production-representative systems meet performance requirements, generation of data to support the system evaluation in support of the Full-Rate Production (FRP) decision, and determination of system readiness to enter Initial Operational Testing (IOT). Government costs include all costs incurred at the test sites and costs associated with Government personnel that will be collecting/analyzing test data, as well as personnel associated with providing oversight of the test activities. The LFT&E will yield information to complement earlier vulnerability tests and modeling and analysis efforts, and will be used to fill data voids from prior testing. It will validate ballistic and blast performance at the system level to completely evaluate vehicle, crew, and occupant survivability. Ten vehicles will undergo testing at ATC and there are three elements to the testing: Controlled Damage Experimentation (CDE), Fire Survivability Testing, and Full-up System Level (FUSL) testing. CDE will be conducted on selected subsystems integrated into the AMPV to determine the consequences of various types of damage. This information will be used to confirm the impact of subsystem damage on platform functionality. Fire Survivability Testing will generate the data required to evaluate the effectiveness of the Automatic Fire Extinguishing System (AFES) to protect crews and internal and stowed equipment from fires expected to be initiated by ballistic impacts. FUSL testing will demonstrate the ballistic resiliency and crew survivability of fully functional, production-representative, combat-loaded AMPV variants and investigate the synergistic effects of various damage mechanisms and failure modes. Government costs include all costs incurred at ATC and costs associated with Government personnel that will be collecting/analyzing test data, as well as personnel associated with providing oversight of the test activities. Finally, as required, vehicle design updates incorporated as corrective actions may be proven out on modified prototype vehicles at select Government test locations. All Government costs incurred as a result of these tests are included in this element. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase is due to the commencement of significant efforts associated with PQT and LFT&E in FY2020.					
Title: FY2019 SBIR /STTR Transfer ***FY 2019 Plans:*** . ***FY 2019 to FY 2020 Increase/Decrease Statement:***	-	4.300	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A					
Accomplishments/Planned Programs Subtotals	184.300	111.821	96.730	-	96.730

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• G80819: *Armored Multi Purpose Vehicle (AMPV)*	558.318	672.742	264.040	221.638	485.678	617.046	621.180	642.734	738.188	10,272.884	14,608.770

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). An Army Systems Acquisition Review Council (ASARC) took place on December 20, 2018 with the Army Acquisition Executive (AAE) and the Vice Chief Staff of the Army (VCSA). The meeting resulted in the approval of the AMPV to enter MS C and LRIP.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army		Date: March 2019
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)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Development Engineering	C/CPIF	BAE : Sterling Heights, MI	155.864	32.301	Dec 2017	18.000	Dec 2018	20.700	Dec 2019	-		20.700	2.953	229.818	-
Prototype Material Contractor	C/CPIF	BAE : Sterling Heights, MI	135.693	13.605	Dec 2017	-		-		-		-	0.000	149.298	-
Prototype Material Government Furnished	Various	Various : .	21.200	5.129	Dec 2017	2.400	Dec 2018	-		-		-	0.000	28.729	-
Contractor System Engineering, Data, Test and Program Management	C/CPIF	BAE : Sterling Heights, MI	90.196	55.665	Dec 2017	16.000	Dec 2018	13.332	Dec 2019	-		13.332	13.887	189.080	-
Procurment of Live Fire Test Assets	Option/ FPIF	BAE : York, PA	-	22.331	Dec 2017	-		-		-		-	0.000	22.331	-
Contractor Support to Qualification, Live Fire, & Operational Testing	C/CPIF	BAE : Sterling Heights, MI	-	-		34.892	Dec 2018	28.053	Dec 2019	-		28.053	33.169	96.114	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		4.300	Nov 2018	-		-		-	0.000	4.300	-
		Subtotal	402.953	129.031		75.592		62.085		-		62.085	50.009	719.670	N/A

Remarks

Armored Multi Purpose Vehicle Tech data and system level product development costs.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	MIPR	PMO : Warren, MI	71.506	21.055	Dec 2017	15.700	Dec 2018	3.888	Dec 2019	-		3.888	2.657	114.806	-
		Subtotal	71.506	21.055		15.700		3.888		-		3.888	2.657	114.806	N/A

Remarks

Armored Multi Purpose Vehicle Support Costs.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government System Testing	MIPR	Various : .	31.760	34.214	Dec 2017	20.529	Dec 2018	30.757	Dec 2019	-		30.757	44.021	161.281	-
		Subtotal	31.760	34.214		20.529		30.757		-		30.757	44.021	161.281	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	506.219	184.300		111.821		96.730		-		96.730	96.687	995.757	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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*

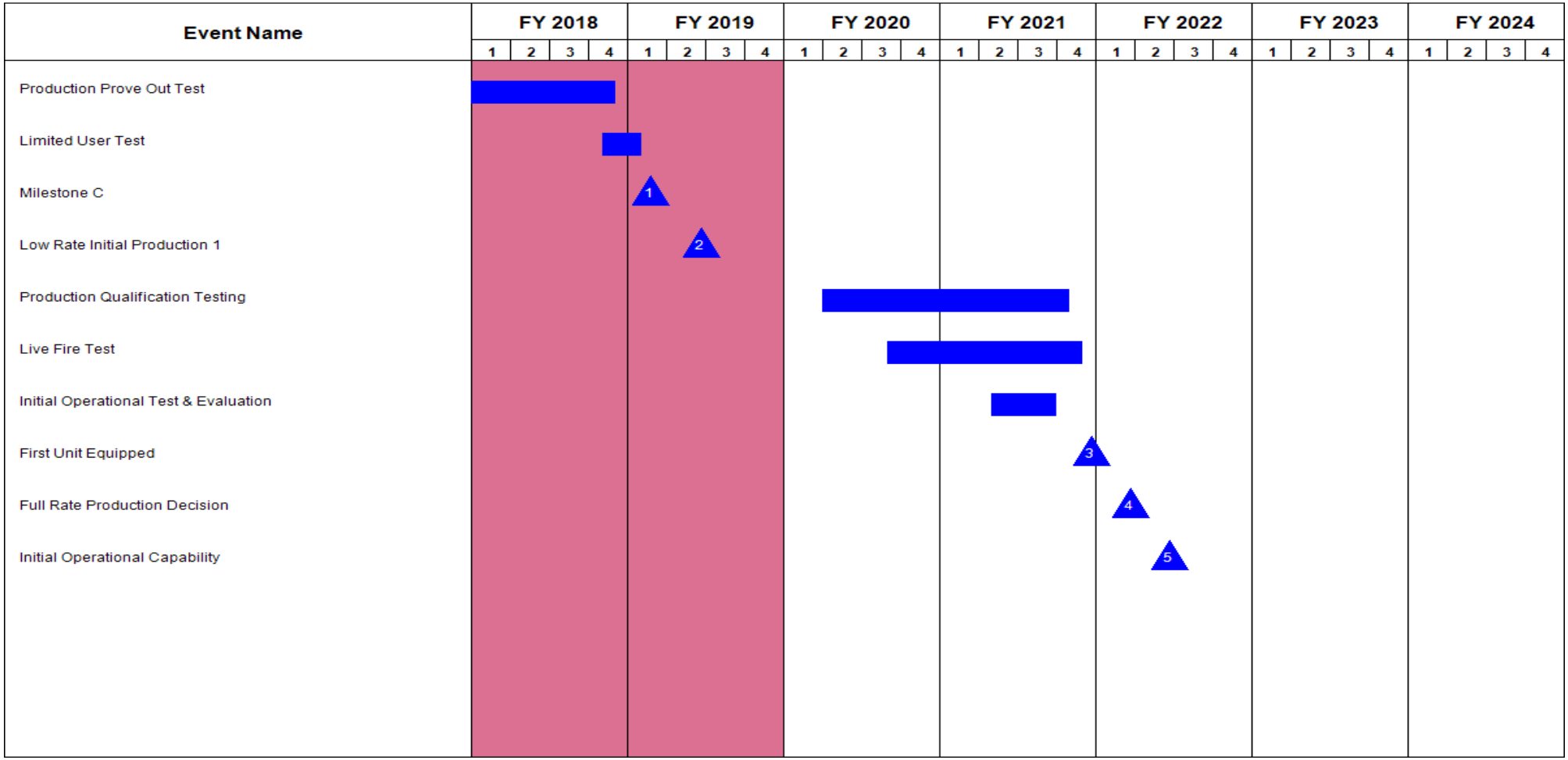

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605028A / *Armored Multi-Purpose Vehicle (AMPV)*	**Project (Number/Name)** EB5 / *Armored Multi-Purpose Vehicle*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Production Prove Out Test	4	2017	4	2018
Limited User Test	4	2018	1	2019
Milestone C	1	2019	1	2019
Low Rate Initial Production 1	2	2019	2	2019
Production Qualification Testing	2	2020	4	2021
Live Fire Test	3	2020	4	2021
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

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605029A *I Integrated Ground Security Surveillance Response Capability (IGSSR-C)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	4.241	3.207	6.699	-	6.699	0.000	0.000	0.000	0.000	0.000	14.147
EQ2: *IntegGrdSecSurvRespC(IGSSR-C)*	-	4.241	3.207	6.699	-	6.699	0.000	0.000	0.000	0.000	0.000	14.147

A. Mission Description and Budget Item Justification

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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	4.418	3.211	5.780	-	5.780
Current President's Budget	4.241	3.207	6.699	-	6.699
Total Adjustments	-0.177	-0.004	0.919	-	0.919
• Congressional General Reductions	-0.004	-0.004			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.173	-			
• Adjustments to Budget Years	-	-	0.919	-	0.919

Change Summary Explanation

FY 2018 variation due to $4 thousand for FFRDC Reduction $173K for SBIR/STTR reduction.
FY 2019 variation due to reduction of $107 thousand for SBIR/STTR.
FY 2020 increase of $0.919 million is due to an adjustment required to align funding with planned acquisition strategy.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605029A / *Integrated Ground Security Surveillance Response Capability (IGSSR-C)*	Project (Number/Name) EQ2 / *IntegGrdSecSurvRespC(IGSSR-C)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EQ2: *IntegGrdSecSurvRespC(IGSSR-C)*	-	4.241	3.207	6.699	-	6.699	0.000	0.000	0.000	0.000	0.000	14.147
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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 2020 Base Funding in the amount of $6.699 million supports completion of the final software solution of IGSSR-C. Completion of a CDR/ System Verification Review (SVR), Developmental and Limited User Test (LUT) events, modeling and simulation in support of achieving a Milestone C decision will be accomplished in FY20.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: IGSSR-C Design and Development	4.241	3.104	6.699	-	6.699
Description: Completes IGSSR-C design efforts and software integration activities, achieves Milestone C decision, procures three hardware sets, and completes IOT&E. ***FY 2019 Plans:*** 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. ***FY 2020 Base Plans:*** FY 2020 Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605029A / *Integrated Ground Security Surveillance Response Capability (IGSSR-C)*	**Project (Number/Name)** EQ2 / *IntegGrdSecSurvRespC(IGSSR-C)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Achieve Milestone C decision, procure three hardware sets, and complete IOT&E. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 increase of $0.919 million is due to an adjustment required to align funding with planned acquisition strategy.					
Title: FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer	-	0.103	-	-	-
Accomplishments/Planned Programs Subtotals	4.241	3.207	6.699	-	6.699

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• M90101: *Base Defense Systems (BDS)*	25.926	39.200	0.000	47.110	47.110	47.581	24.028	24.028	24.509	0.000	232.382

Remarks

D. Acquisition Strategy

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.

The IGSSR-C program received an approved Materiel Development Decision (MDD) from the Milestone Decision Authority (MDA) on 4 December 2015, and achieved a Milestone B decision on 29 Sep 2017.

The acquisition strategy for IGSSR-C was approved on 5 December 2016 by the MDA, which approved plans to leverage a contract through the Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir, Virginia to develop, integrate and test the software solution to meet the IGSSR-C requirements.

Milestone C is planned for 2QFY21

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605029A / *Integrated Ground Security Surveillance Response Capability (IGSSR-C)*	**Project (Number/Name)** EQ2 / *IntegGrdSecSurvRespC(IGSSR-C)*

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605029A / *Integrated Ground Security Surveillance Response Capability (IGSSR-C)*	Project (Number/Name) EQ2 / *IntegGrdSecSurvRespC(IGSSR-C)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IGSSR-C Project Management	MIPR	PM FPS : Fort Belvoir, VA	0.151	0.924		0.441	May 2019	0.556	May 2020	-		0.556	0.000	2.072	-
		Subtotal	0.151	0.924		0.441		0.556		-		0.556	0.000	2.072	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IGSSR-C Design	C/CPFF	NVESD/MTEQ : Ft. Belvoir	1.873	1.898		0.971	Feb 2019	-		-		-	Continuing	Continuing	Continuing
IGSSR-C Prototypes	C/CPFF	NVESD/MTEQ : Ft. Belvoir	1.865	-		0.397	Feb 2019	3.915	Jan 2020	-		3.915	Continuing	Continuing	Continuing
IGSSR-C Independent Software Assessment	MIPR	Carnegie Mellon University Software Engineering Institute : Pittsburgh, PA	-	0.456		0.362	Apr 2019	0.502	Mar 2020	-		0.502	Continuing	Continuing	Continuing
FY 2019 SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.103		-		-		-	0.000	0.103	-
		Subtotal	3.738	2.354		1.833		4.417		-		4.417	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IGSSR-C Design Support	MIPR	RDECOM CERDEC : Fort Belvoir, VA	0.505	0.193		0.156	Feb 2019	-		-		-	Continuing	Continuing	Continuing
		Subtotal	0.505	0.193		0.156		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605029A / *Integrated Ground Security Surveillance Response Capability (IGSSR-C)*	**Project (Number/Name)** EQ2 / *IntegGrdSecSurvRespC(IGSSR-C)*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IGSSR-C Test and Evaluation	MIPR	ATEC : Aberdeen Proving Ground, MD	0.395	0.655		0.508	Feb 2019	1.454	Feb 2020	-		1.454	Continuing	Continuing	Continuing
IGSSR-C Modeling and Simulation	MIPR	Night Vision and Electronic Sensors Directorate : Ft. Belvoir, VA	-	0.115		0.117	Feb 2019	0.117	Mar 2020	-		0.117	Continuing	Continuing	Continuing
IGSSR-C Software Support Planning and Documentation	MIPR	CECOM SEC : Aberdeen, MD	-	-		0.152	Feb 2019	0.155	Mar 2020	-		0.155	0.000	0.307	-
		Subtotal	0.395	0.770		0.777		1.726		-		1.726	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4.789	4.241		3.207		6.699		-		6.699	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605029A / *Integrated Ground Security Surveillance Response Capability (IGSSR-C)*	**Project (Number/Name)** EQ2 / *IntegGrdSecSurvRespC(IGSSR-C)*

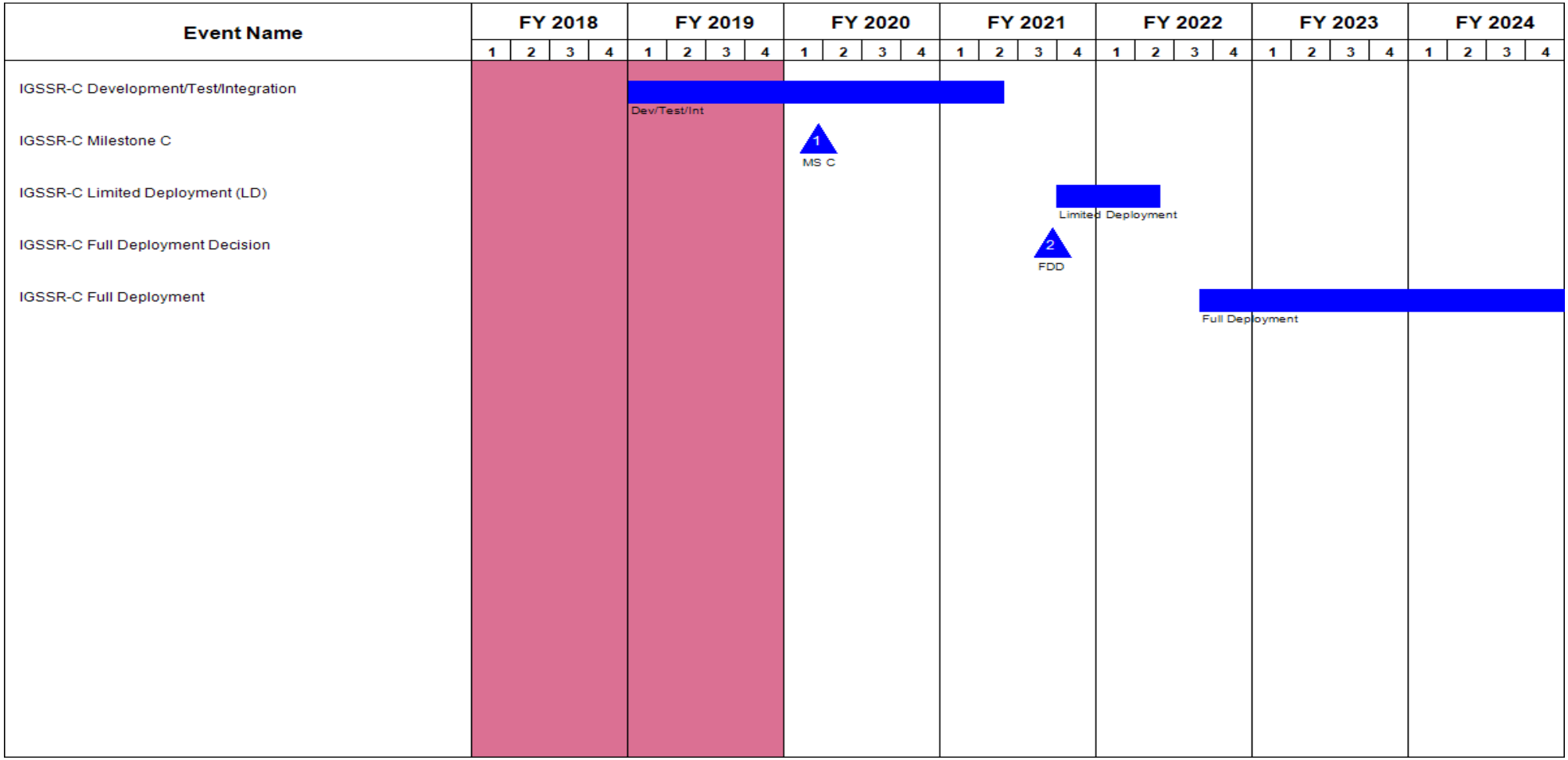

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605029A / *Integrated Ground Security Surveillance Response Capability (IGSSR-C)*	**Project (Number/Name)** EQ2 / *IntegGrdSecSurvRespC(IGSSR-C)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
IGSSR-C Risk Reduction	4	2015	4	2017
IGSSR-C Development/Test/Integration	1	2019	2	2021
IGSSR-C Milestone C	1	2020	1	2020
IGSSR-C Limited Deployment (LD)	4	2021	2	2022
IGSSR-C Full Deployment Decision	3	2021	3	2021
IGSSR-C Full Deployment	3	2022	3	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605030A *I Joint Tactical Network Center (JTNC)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	15.242	15.869	15.882	-	15.882	5.833	5.835	5.490	5.847	Continuing	Continuing
EA8: *Joint Tactical Networking Center*	-	15.242	15.869	15.882	-	15.882	5.833	5.835	5.490	5.847	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. Fiscal Year (FY) 2018 to FY 2020 funding reflects the full JTNC requirement with the consolidated funding from the other Services, while FY 2021 and beyond reflects the Army one-third portion of total program RDT&E funds. Out-year funding is programmed in PE 0605030A by the Army, PE 0605030N by the Navy and PE 0605030F by the Air Force. Prior to submission of the President's Budget, the funding is consolidated in PE 0605030A for execution.

A. Mission Description and Budget Item Justification

The JTNC is responsible for ensuring interoperable, secure, and affordable 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 and industry 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), National Telecommunication and Information Administration (NTIA), the Services, as well as industry partners. Particular attention is paid to ensuring that interagency work is collaborative and eliminates duplicative capability. The JTNC enables a common software baseline that is hardware agnostic leading to increased competition for Software Defined Radios.

The Joint Tactical Networking Center supports the Army's Network Modernization Strategy Line of Effort (LOE).

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army					Date: March 2019
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 Network Center (JTNC)*		
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	15.877	15.889	5.723	-	5.723
Current President's Budget	15.242	15.869	15.882	-	15.882
Total Adjustments	-0.635	-0.020	10.159	-	10.159
• Congressional General Reductions	-0.013	-0.020			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.622	-			
• Adjustments to Budget Years	-	-	10.159	-	10.159

Change Summary Explanation

FY 2020 - Net increase of $10.159 million is the result of funding realignment from Navy PE 0605030N and Air Force PR 0605030F to Army PE 0605030A as part of the Joint Budget Strategy.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605030A / *Joint Tactical Network Center (JTNC)*	Project (Number/Name) EA8 / *Joint Tactical Networking Center*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EA8: *Joint Tactical Networking Center*	-	15.242	15.869	15.882	-	15.882	5.833	5.835	5.490	5.847	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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. Fiscal Year (FY) 2018 to FY 2020 funding reflects the full JTNC requirement with the consolidated funding from the other Services, while FY 2021 and beyond reflects the Army one-third portion of total program RDT&E funds. Out-year funding is programmed in PE 0605030A by the Army, PE 0605030N by the Navy and PE 0605030F by the Air Force. Prior to submission of the President's Budget, the funding is consolidated in PE 0605030A for execution.

A. Mission Description and Budget Item Justification

The JTNC is responsible for ensuring interoperable, secure, and affordable 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 and industry 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), National Telecommunication and Information Administration (NTIA), the Services, as well as industry partners. Particular attention is paid to ensuring that interagency work is collaborative and eliminates duplicative capability. The JTNC enables a common software baseline that is hardware agnostic leading to increased competition for Software Defined Radios (SDR).

The Joint Tactical Networking Center supports the Army's Network Modernization Strategy Line of Effort (LOE).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: DoD Waveform IR Support, Waveform Standards Evolution and Compliance & Certification Analysis	15.242	15.869	15.882
Description: Joint Tactical Networking Center (JTNC) aligns with the JTNC BoD, USD(AT&L), DoD Chief Information Officer (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 compliance and certification recommendations on wireless communications			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605030A / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** EA8 / *Joint Tactical Networking Center*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
products in support of service, multiservice, and coalition forces. The Joint Tactical Networking Center supports the Army's Network Modernization Strategy Line of Effort 1A - Unified Network. ***FY 2019 Plans:*** The JTNC will conduct waveform analyses of the following waveforms (based on waveform software and related technical artifact availability) to include: Commercial (Harris) - Advanced Networking Wideband Waveform (ANW2); DoD (Navy) - Mobile User Objective System (MUOS) v3.1.5.2, Link 16 Engineering Release 0G (ER0G), Second-Generation Anti-Jam Tactical UHF Radio for North Atlantic Treaty Organization (NATO) (SATURN) and the Joint Waveform (formally Uniform MEECN Mode). 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 the Department of Defense (DoD) Waveform Information Repository (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. ***FY 2020 Plans:*** Continue analysis of Board of Directors approved waveforms in accordance with Service priorities and the FY 2020 JTNC Management Plan. Continue collecting relevant software, technical documentation, cataloging and inducting other DoD Communication Waveforms listed in the DoD Communication Waveform Inventory. Continue to enhance DoD Waveform IR capability and approved Standards promulgation. Continue the development of the tactical communications vendor product capability characterization process for commercial off-the-shelf (COTS) and non-developmental item (NDI) tactical communication products. Continue to evolve DoD Waveform Standards to facilitate common development, interoperability and re-use, reducing product development time and facilitating faster delivery of capabilities to warfighters. Continue to conduct technical waveform and software artifact analyses against published standards. Continue to support export requests and analyses of products for exportability. Continue to certify secure, reusable software waveforms based on government controlled open architecture to encourage a competitive, cost effective, interoperable networking environment. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 accounts for SBIR / STTR Transfer ($0.582). FY 2019 to FY 2020 decrease of $0.013 is consistent with anticipated programmatic requirements.			
Accomplishments/Planned Programs Subtotals	15.242	15.869	15.882

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605030A / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** EA8 / *Joint Tactical Networking Center*

C. Other Program Funding Summary ($ in Millions)

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 FY 2021 and beyond reflects only approximately one-third of total funding. Other funding is as follows (PB20 locked positions):

Navy RDTE: 0605030N, 3077. FY 2021 = 4,644 // FY 2022 = 4,741 // FY 2023 = 4,835 // FY 2024 = 4,932
Air Force RDTE: 0605030F, 655068. FY 2021 = 5,737 // FY 2022 = 5,852 // FY 2023 = 5,969 // FY 2024 = 6,088

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.

D. Acquisition Strategy

Joint Tactical Networking Center 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 revalidated 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 Government Program of Record (POR) and Industry COTS and NDI Waveform products. The services derived from these core functions reinforce an acquisition environment which ensures that interoperable, secure, and affordable joint tactical waveforms and wireless communications applications can operate in a variety of hardware transport solutions.

The FY2020 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), JTNC Standards Interface Control Working Group (ICWG), and continue development of the Capabilities Characterization and Tactical Communications Marketplace (CC & TCM).

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605030A / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** EA8 / *Joint Tactical Networking Center*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Various	Multiple Contract Awards : Various	6.645	0.276	Dec 2017	0.210	Oct 2018	0.180	Oct 2019	-		0.180	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	G2 Software Systems : San Diego, CA	2.010	0.947	Dec 2017	0.831	Nov 2018	0.384	Nov 2019	-		0.384	Continuing	Continuing	Continuing
Program Management Support	Allot	Aberdeen Proving Grounds : Aberdeen. MD	0.684	0.173	Nov 2017	0.255	Oct 2018	0.105	Oct 2019	-		0.105	Continuing	Continuing	Continuing
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.072	Oct 2018	-		-		-	Continuing	Continuing	Continuing
Program Management Support	MIPR	SSC PACIFIC : San Diego, CA	0.364	-		-		-		-		-	0.000	0.364	0.364
Program Management Support	FFRDC	MITRE : McLean, VA	0.058	-		-		-		-		-	0.000	0.058	0.058
		Subtotal	9.761	1.396		1.368		0.669		-		0.669	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JTNC Product Development Support	MIPR	SSC PACIFIC : San Diego, CA	3.207	0.822	Dec 2017	0.572	Nov 2018	0.399	Oct 2019	-		0.399	Continuing	Continuing	Continuing
JTNC Product Development Support	C/CPFF	G2 Software Systems : San Diego, CA	5.595	2.742	Nov 2017	2.875	Oct 2018	2.485	Nov 2019	-		2.485	Continuing	Continuing	Continuing
JTNC Product Development Support	MIPR	SSC ATLANTIC : Charleston, SC	-	0.053	Dec 2017	0.151	Oct 2018	2.974	Oct 2019	-		2.974	Continuing	Continuing	Continuing
JTNC Product Development Support	MIPR	Various : Aberdeen. MD	-	1.147	Oct 2017	1.097	Oct 2018	0.294	Nov 2019	-		0.294	Continuing	Continuing	Continuing
JTNC Product Development	C/CPFF	Booz Allen Hamilton : San Diego, CA	1.184	-		-		-		-		-	0.000	1.184	1.184

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605030A / *Joint Tactical Network Center (JTNC)*	Project (Number/Name) EA8 / *Joint Tactical Networking Center*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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	55.126	4.764		4.695		6.152		-		6.152	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JTNC Engineering/ Technical Support	C/CPFF	G2 Software Systems : San Diego, CA	4.494	0.973	Dec 2017	0.771	Oct 2018	0.716	Nov 2019	-		0.716	Continuing	Continuing	Continuing
JTNC Engineering/ Technical Support	FFRDC	MITRE Corporation : McLean, VA	0.667	0.159	Nov 2017	0.151	Oct 2018	0.157	Oct 2019	-		0.157	Continuing	Continuing	Continuing
JTNC Engineering/ Technical Support	MIPR	Aberdeen Proving Grounds : Aberdeen, MD	1.284	0.741	Nov 2017	0.758	Oct 2018	0.209	Nov 2019	-		0.209	Continuing	Continuing	Continuing
JTNC Engineering/ Technical Support	MIPR	SSC PACIFIC : San Diego, CA	1.234	0.605	Oct 2017	0.706	Nov 2018	0.357	Oct 2019	-		0.357	Continuing	Continuing	Continuing
JTNC Engineering/ Technical Support	MIPR	Various : San Diego, CA	-	0.877	Nov 2017	0.785	Nov 2018	1.340	Nov 2019	-		1.340	Continuing	Continuing	Continuing
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.510	Oct 2018	-		-		-	Continuing	Continuing	Continuing
JTNC Engineering/ Technical Support	C/CPFF	Booz Allen Hamilton : San Diego	14.965	-		-		-		-		-	0.000	14.965	14.965
		Subtotal	22.644	3.355		3.681		2.779		-		2.779	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605030A / *Joint Tactical Network Center (JTNC)*	Project (Number/Name) EA8 / *Joint Tactical Networking Center*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development/Test & Evaluation	MIPR	SSC PACIFIC : San Diego, CA	4.027	1.377	Dec 2017	2.027	Oct 2018	1.905	Oct 2019	-		1.905	Continuing	Continuing	Continuing
Development/Test & Evaluation	C/CPFF	G2 Software Systems 01 : San Diego, CA	1.924	4.034	Dec 2017	3.647	Oct 2018	3.259	Nov 2019	-		3.259	Continuing	Continuing	Continuing
Development/Test & Evaluation	C/CPFF	JITC/Multiple Awards : Various	1.196	0.144	Nov 2017	0.171	Oct 2018	0.675	Nov 2019	-		0.675	Continuing	Continuing	Continuing
Development/Test & Evaluation	C/CPFF	Booz Allen Hamilton - NSA : Ft. Meade, MD	-	-		0.280	Dec 2018	0.443	Nov 2019	-		0.443	Continuing	Continuing	Continuing
Development/Test & Evaluation	MIPR	National Security Agency : Ft. Meade, MD	0.603	0.172	Oct 2017	-		-		-		-	0.000	0.775	0.775
Development/Test & Evaluation	C/CPFF	G2 Software Systems 04 : San Diego, CA	5.078	-		-		-		-		-	0.000	5.078	5.078
Development/Test & Evaluation	MIPR	SSC ATLANTIC : Charleston, SC	0.160	-		-		-		-		-	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	14.230	5.727		6.125		6.282		-		6.282	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	101.761	15.242		15.869		15.882		-		15.882	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605030A / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** EA8 / *Joint Tactical Networking Center*

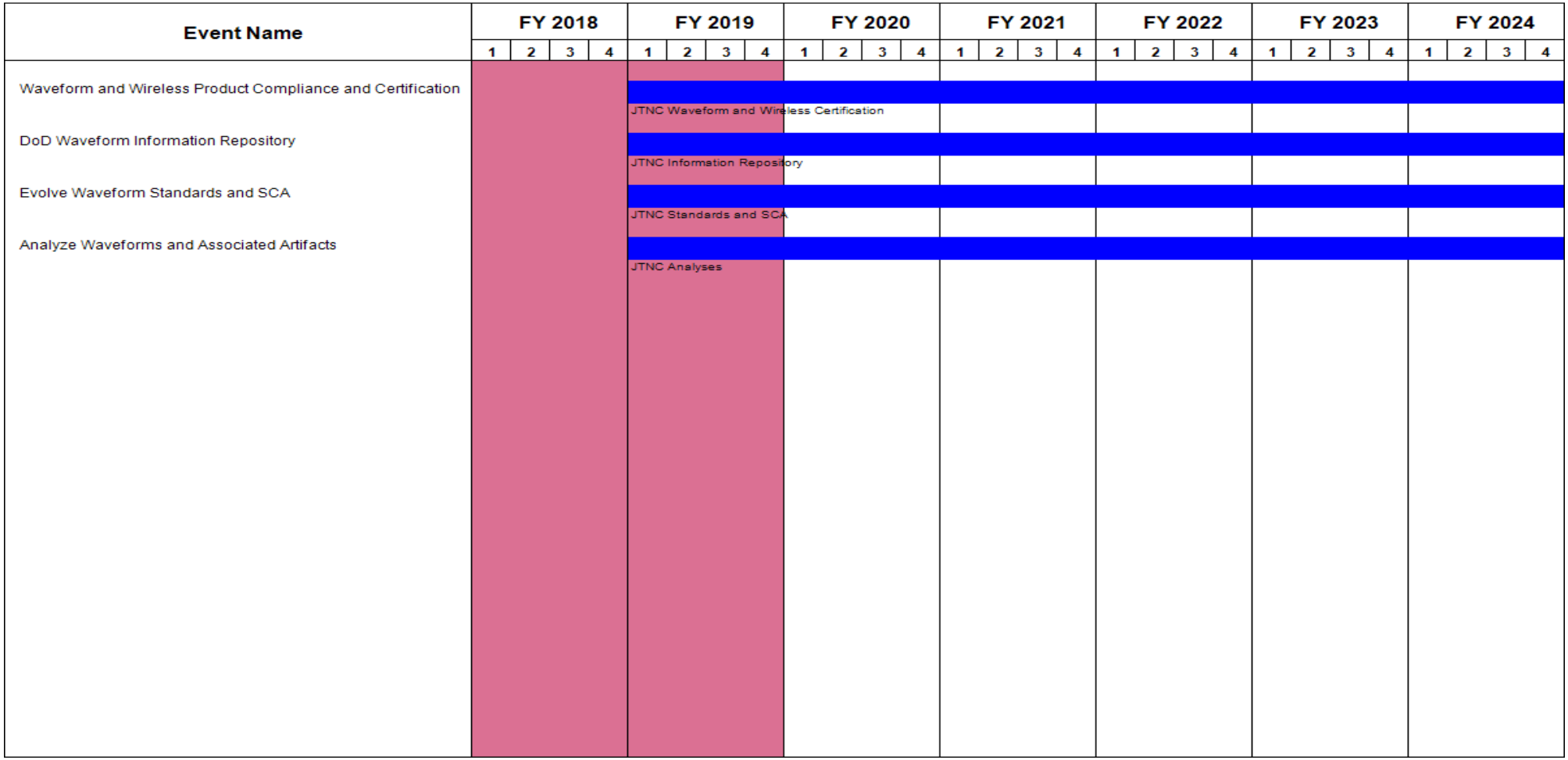

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605030A / *Joint Tactical Network Center (JTNC)*	**Project (Number/Name)** EA8 / *Joint Tactical Networking Center*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Waveform and Wireless Product Compliance and Certification	1	2019	4	2024
DoD Waveform Information Repository	1	2019	4	2024
Evolve Waveform Standards and SCA	1	2019	4	2024
Analyze Waveforms and Associated Artifacts	1	2019	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605031A / *Joint Tactical Network (JTN)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	46.051	41.920	40.808	-	40.808	26.630	36.027	26.193	14.312	0.000	231.941
EF5: *Joint Tactical Network (JTN)*	-	17.295	11.142	15.324	-	15.324	5.438	4.306	4.160	4.078	0.000	61.743
EX6: *Waveforms*	-	28.756	30.778	25.484	-	25.484	21.192	31.721	22.033	10.234	0.000	170.198

Note

As part of the joint program budget strategy for Joint Enterprise Network Manager (JENM), each Military Department (MILDEP) budgets for approximately one-third of the total program RDT&E funds for joint efforts. Joint funding is programmed in the Navy PE 0605030N and Air Force PE 0605030F. Prior to submission of the President's Budget, the funding is consolidated in the Army PE (0605031A) for execution.

NOTE:
The Joint Tactical Networking Center (JTNC) Acquisition Decision Memorandum (ADM) of 20 Jan 2014 officially chartered the JTNC, assigned responsibility for the development and sustainment of JENM to the PM Joint Tactical Networks (JTN), and transitioned waveform development and sustainment to the Services. The Army Program Executive Office (PEO) Command Control Communications Tactical (C3T) Memos of 25 Jun 2015 transferred all program, development, and configuration control of JENM from Product Manager (PdM) JENM under PM JTN to the Army as Lead service under PdM Tactical Cyber Network Operations (TCNO) under PM Tactical Network (formally PM WIN-T). Waveform development transferred to PM Tactical Radios, who is responsible for program of record development.

JENM, funded in project EF5, is a software only program.

A. Mission Description and Budget Item Justification

EF5 project: In support of Line of Effort (LOE) 1B, Network Enabling Functions, JENM software provides a single network management tool for the Warfighter to plan, configure, load, and manage the Joint Services' Software Defined Radios (SDRs) and networks in the field, a capability not available in legacy planning systems. JENM configures numerous Tactical 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), 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. JENM is deployed on the Joint Tactical Networking Environment NetOps Toolkit (J-TNT) from Division to the Company level based upon the Basis of Issue Plan.

EX6 project: Beginning in FY 2018, based on the results of the FY 2017 Army Network Analysis, the EX6 project refocused efforts to improve waveforms for lower and mid-tier networks. The effort focuses 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605031A *I Joint Tactical Network (JTN)*

FY 2020 Base RDTE dollars in the amount of $40.808 million supports the continued development of the Waveforms and JENM, testing support and the program management office.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	44.150	41.972	29.954	-	29.954
Current President's Budget	46.051	41.920	40.808	-	40.808
Total Adjustments	1.901	-0.052	10.854	-	10.854
• Congressional General Reductions	-0.035	-0.052			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	3.640	-			
• SBIR/STTR Transfer	-1.704	-			
• Adjustments to Budget Years	-	-	10.854	-	10.854

Change Summary Explanation

EX6: $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.

EF5: (-$1.565) million of FY 2019 RDTE funds were reduced for JENM development IAW tactical radio requirement updates.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EF5: *Joint Tactical Network (JTN)*	-	17.295	11.142	15.324	-	15.324	5.438	4.306	4.160	4.078	0.000	61.743
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

LOE 1B, Network Enabling Functions Joint Enterprise Network Manager (JENM))

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: FY20 - $1.121M; FY21 - $1.139M and FY22 - $0.927M.

JENM is a software only program.

A. Mission Description and Budget Item Justification

EF5 project: The Joint Enterprise Network Manager (JENM) software provides a single network management tool for the Warfighter to plan, configure, load, and manage the Joint Services' Software Defined Radios (SDRs) and networks in the field, a capability not available in legacy planning systems. JENM configures numerous Tactical 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), 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. JENM is deployed on the Joint Tactical Networking Environment NetOps Toolkit (J-TNT) from Division to the Company level based upon the Basis of Issue Plan.

The Army will pivot away from JENM to new prototyping activities for emerging Tactical Radio and planning requirements for a simplified workflow based planning solution that leverages COTS capabilities to rapidly meet emerging needs from the Network CFT & ITN.

FY 2020 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 2018	FY 2019	FY 2020
Title: JENM Program Office Support	1.553	1.596	0.318

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Program Management Office support in the development of the JENM system. ***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 2020 Plans:*** Program Office funding will continue support JENM design, engineering, integration and test of mid and lower tier planning and management application for the Software Defined Radio (SDR) network. Support to align with the Unified Network Operations (UNO) vision to provide further integration of the 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, Airborne Radio Communications (ARC) 210/231, USMC and USAF 117G MUOS, as well as full threshold requirement support for HMS Manpack and Leader Radios. Continued 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. JENM Program Office Support will support the completion of JENM v3.4 Transitioning to Sustainment in addition to JENM v3.5 development, which include complete MUOS simplification, Upgrades to JENM Public Key Infrastructure (PKI) Certificate Management, and Cyber Enhancements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** JENM Program Office Support funding experiencing a decrease from FY19 to FY20 due to JENM v3.4 Transitioning to Sustainment. In FY20, JENM v3.5 development, which include complete MUOS Simplification, Upgrades to JENM Public Key Infrastructure (PKI) Certificate Management, and Cyber Enhancements, continuing at reduced funding and manpower levels.			
Title: JENM Development	13.012	8.562	13.394

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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 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, Tactical Scalable Mobile Ad-Hoc Networking Waveform (TSM), MUOS, SINCGARS, SATCOM, and Integrated Waveforms. JENM will also manage the completion of deferred program requirements as well as radio planning and management enhancements. ***FY 2020 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, Airborne Radio Communications (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, MUOS, SINCGARS, SATCOM, and Integrated Waveforms. JENM will also manage the completion of deferred program requirements. JENM Program Office Support will support the completion of JENM v3.4 Transitioning to Sustainment in addition to JENM v3.5 development, which include complete MUOS simplification, Upgrades to JENM Public Key Infrastructure (PKI) Certificate Management, and Cyber Enhancements. ***FY 2019 to FY 2020 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
JENM funding experiences a decrease from FY19 to FY20 due to JENM v3.4 Transitioning to Sustainment. In FY20, JENM v3.5 development, which include complete MUOS Simplification, Upgrades to JENM Public Key Infrastructure (PKI) Certificate Management, and Cyber Enhancements, continues at reduced funding and manpower levels.			
Title: Test and Evaluation ***Description:*** Test and Evaluation of JENM ***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 2020 Plans:*** JENM will provide direct support to the FY20 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 undergo a formal qualification test. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** JENM will experience an increase in funding from FY19 to FY20 due to supporting the FY20 Developmental and Operational Test (DT/OT) of the PdM HMS Leader radio, undergoing an Operational Test (OT) assessment to ensure it continues to meet the needs of today's Soldiers, and a formal qualification test (FQT).	2.730	0.576	1.612
Title: FY19 SBIR/STTR Transfer ***FY 2019 Plans:*** FY19 SBIR/STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY19 accounts for SBIR/STTR Transfer	-	0.408	-
Accomplishments/Planned Programs Subtotals	17.295	11.142	15.324

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 0605031N: *0605031N; JTN, RDTE,N*	2.800	2.617	2.677	-	2.677	2.705	1.747	-	-	Continuing	Continuing
• 0605031F: *0605031F; JTNC, RDTE,F*	4.691	3.735	3.798	-	3.798	3.844	3.910	3.979	-	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost

Remarks

PE 0605031A contains only the JTN (PdM Waveforms and PdM TCNO (JENM)) RDTE funding.

For FY2019 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, APE (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: FY20 - $1.121M; FY21 - $1.139M and FY22 - $0.927M.
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).

Product Manager Tactical Cyber & Network Operations (TCNO) manages a Government Owned, Government Operated (GOGO) Software Development & Integration Facility which employs competitive contracting strategies for software development & sustainment of the network manager components to ensure warfighter access to the best technology and innovative capabilities while addressing emerging threats and future requirements via an affordable, operationally effective, and timely framework.

JENM will support the completion of JENM v3.4 Transitioning to Sustainment in addition to JENM v3.5 development, which include complete MUOS Simplification, Upgrades to JENM Public Key Infrastructure (PKI) Certificate Management, and Cyber Enhancements.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JENM Program Management Support	C/CPFF	G2 Software Systems : San Diego, CA	0.809	0.381	Nov 2017	0.228	Nov 2018	0.151	Nov 2019	-		0.151	0.000	1.569	-
JENM Program Management Support	C/CPIF	Pending Contract Award : Aberdeen, MD	0.348	-		-		-		-		-	0.000	0.348	-
JENM Program Management Support	Allot	USAASC : Aberdeen, MD	0.116	-		-		-		-		-	Continuing	Continuing	Continuing
JENM Program Management Support	MIPR	SSC PACIFIC : San Diego, CA	0.238	0.598	Oct 2017	0.946	Oct 2018	0.106	Nov 2019	-		0.106	0.000	1.888	-
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	3.867	0.979		1.174		0.257		-		0.257	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JENM NMRIL Development	C/CPFF	G2 Software Systems : San Diego, CA	0.992	-		-		-		-		-	0.000	0.992	-
JENM NMRIL Development	C/CPFF	Pending Contract Award : Aberdeen, MD	0.875	-		-		-		-		-	0.000	0.875	-
JENM NMRIL Development	MIPR	SSC PACIFIC : San Diego, CA	1.741	9.946	Oct 2017	8.984	Oct 2018	2.744	Nov 2019	-		2.744	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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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
JENM Radio Planning and Management Enhancement	TBD	Harris, CodeMettle : Aberdeen, MD	-	3.640		-		10.880		-		10.880	0.000	14.520	-
FY19 SBIR/STTR Transfer	TBD	TBD : TBD	-	-		0.408		-		-		-	0.000	0.408	-
		Subtotal	30.321	13.586		9.392		13.624		-		13.624	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JENM v3 Software Support	C/CPFF	G2 Software Systems : San Diego, CA	0.350	-		-		-		-		-	0.000	0.350	-
JENM v3 Software Support	C/CPFF	Pending Contract Award : Aberdeen, MD	0.537	-		-		-		-		-	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JENM v3 Software Support	MIPR	SSC PACIFIC : San Diego, CA	0.582	-		-		-		-		-	Continuing	Continuing	Continuing
Development/Engineering/ Technical Support	C/CPFF	Various : various	2.198	-		-		-		-		-	0.000	2.198	1.985
		Subtotal	3.667	-		-		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JENM v3.4 System Engineering and Test	MIPR	SSC PACIFIC : San Diego, CA	1.104	1.193	Oct 2017	0.013	Oct 2018	-		-		-	Continuing	Continuing	Continuing
JENM v3.5 System Engineering and Test	MIPR	NM RIL : San Diego, CA	1.641	1.537	Nov 2017	0.563	Oct 2018	0.250	Nov 2019	-		0.250	0.000	3.991	-
JENM v3.5x System Engineering and Test	TBD	NM RIL : San Diego, CA	-	-		-		1.193	Nov 2019	-		1.193	0.000	1.193	-
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	9.916	2.730		0.576		1.443		-		1.443	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	47.771	17.295		11.142		15.324		-		15.324	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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)*

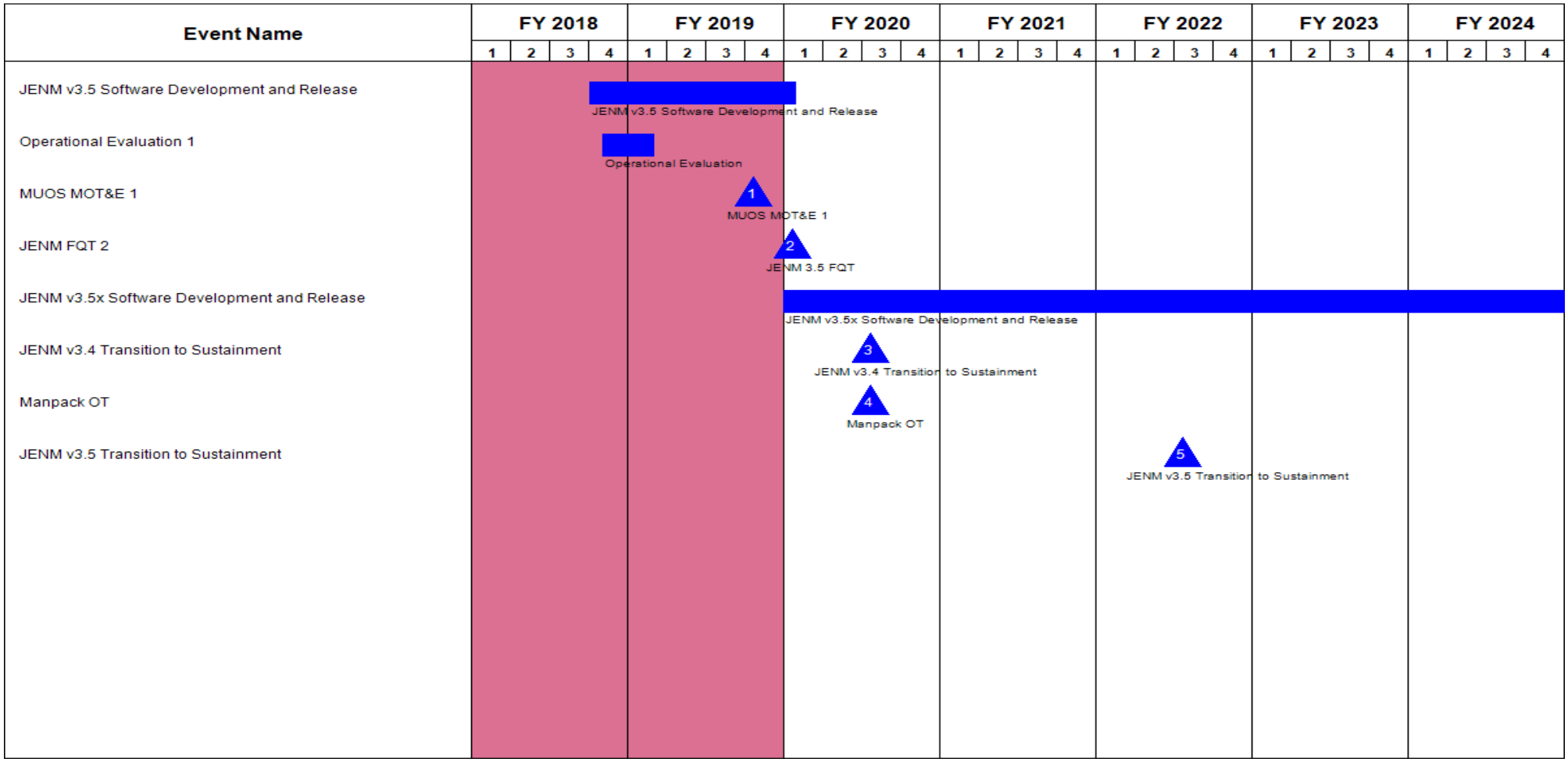

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605031A / *Joint Tactical Network (JTN)*	**Project (Number/Name)** EF5 / *Joint Tactical Network (JTN)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
JENM v3.5 Software Development and Release	4	2018	1	2020
Operational Evaluation 1	4	2018	1	2019
MUOS MOT&E 1	4	2019	4	2019
JENM FQT 2	1	2020	1	2020
JENM v3.5x Software Development and Release	1	2020	4	2026
JENM v3.4 Transition to Sustainment	3	2020	3	2020
Manpack OT	3	2020	3	2020
JENM v3.5 Transition to Sustainment	3	2022	3	2022

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / *Joint Tactical Network (JTN)*	Project (Number/Name) EX6 / *Waveforms*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EX6: *Waveforms*	-	28.756	30.778	25.484	-	25.484	21.192	31.721	22.033	10.234	0.000	170.198
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Waveforms program supports the Army Network Modernization Strategy Line of Effort 1, Unified Network

In order to support the overall connectivity for the Unified Network, PdM Waveforms mission execution provides the transport technologies allowing soldiers to better communicate between echelons. PdM Waveforms' technology assessments, integration, and configuration management enable more fluid and swift updates to the Unified Network capabilities by focusing on the Soldier's mission and safety.

PdM Waveforms delivers, maintains, and upgrades portable, interoperable, mobile ad hoc networking waveforms (MANET), advance 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:

- Work with Industry Partners to assess, analyze, and vet Commercial Off-The-Shelf (COTS)/Non-Developmental Item (NDI) waveforms in support of the Integrated Tactical Network (ITN)
- Pursue alternative waveforms to reduce the complexity of MANET
- 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 2020 Base RDTE dollars in the amount of $25.484 million supports the continued development of the waveforms, testing support, and the program management office.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Program Management Office Support	3.772	3.383	3.138
Description: Provides Program Management Office (PMO) support for Waveforms enhancements.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605031A / *Joint Tactical Network (JTN)*	**Project (Number/Name)** EX6 / *Waveforms*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: Continue program management support for PdM Waveforms. ***FY 2020 Plans:*** Program Management support for PdM Waveforms. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to efficiencies.			
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: - Cyberspace and Cybersecurity Operations * Focused on IP traffic (data) * Intrusion Detection and Intrusion Prevention of Army networks within Tactical Radio platforms - Electronic Warfare (EW) * Focused on Radio Frequency (RF/voice) * Electronic Attack (EA) * Electronic Protection (EP) * Electronic Survivability (ES) * Includes Anti-jam protection and deployment - Spectrum Management Operations (SMO). * Development of capabilities for the warfighter to maintain communication in spectrum denied environments. 2. SINCGARS Development of a Frequency Hopping (FH3) mode, which will address the adversary's EA capabilities. Development of transmission security protocols. 3. Warrior Robust Enhanced Network (WREN) (formerly know as Soldier Radio Waveforms (SRW) Narrowband) Integration Development of WREN and the integration of Narrowband Code into the SRW baseline support the following warfighter capability gaps:	19.802	21.100	12.340

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605031A / *Joint Tactical Network (JTN)*	**Project (Number/Name)** EX6 / *Waveforms*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
- Availability of adequate spectrum to deploy a full Brigade Combat Team of subnets is increasingly becoming a problem in combat environments. - Enhance Scalability and longer distances between communication nodes. - Maintaining communication capabilities in foliage-heavy environments. - Operation in VHF and UHF bands with narrower bandwidths. ***FY 2019 Plans:*** - Mitigate CEMA threats - Mitigate interference affects & coordinated EW and communications threats for SINCGARS/WREN. - Develop EW Enabled cyber capabilities ***FY 2020 Plans:*** Continue to mitigate CEMA threats for SINCGARS/WREN, mitigate interference affects & coordinated EW and communications threats, and develop EW Enabled cyber capabilities ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due cancellation of SRW Integration / Enhancements			
Title: Waveforms Software Support & Systems Engineering	2.691	2.524	2.912
Description: PdM Waveforms software support and systems engineering for waveforms and network manager applications provide the following: - 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). - Configuration Management of waveform product baselines and changes via the Configuration Control Board (CCB). - Technical interface to pertinent stakeholders across PM TR and PEO C3T. - Provide necessary assistance and oversight to Waveforms product specific engineering. ***FY 2019 Plans:*** Continue software support and systems engineering efforts as described above in support of PdM Waveforms. ***FY 2020 Plans:*** Continue software support and systems engineering efforts as described above in support of PdM Waveforms ***FY 2019 to FY 2020 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605031A / *Joint Tactical Network (JTN)*	**Project (Number/Name)** EX6 / *Waveforms*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Increase due to software engineering support.			
Title: Waveforms Testing & Evalution ***Description:*** Waveforms Testing and Evaluation insures the following: - compatibility with current components - integrations with appropriate subsystems - validation of waveform performance including Anti-jam capability, spectral efficiency, and Network optimization - compliance with current security verification requirements NSA and JTeL IA certifications - compliance with current military standard documentation - interoperability with joint systems ***FY 2019 Plans:*** Continue testing and evaluation procedures for waveforms code development and defect fixes to insure tactical waveforms meet warfighter requirements. ***FY 2020 Plans:*** Conduct testing and evaluation procedures for continued code development and defect fixes of Government-owned waveforms and perform evaluation and characteristics analysis of commercial waveforms for potential Government utilization to meet warfighter requirements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to performing evaluation and characteristics analysis of commercial waveforms.	2.491	2.643	7.094
Title: FY 2019 SBIR/STTR Transfer ***Description:*** Accounting for SBIR/STTR Transfer ***FY 2019 Plans:*** Accounting for SBIR/STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Accounting for SBIR/STTR Transfer	-	1.128	-
Accomplishments/Planned Programs Subtotals	28.756	30.778	25.484

C. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605031A / *Joint Tactical Network (JTN)*	**Project (Number/Name)** EX6 / *Waveforms*

C. Other Program Funding Summary ($ in Millions)

Remarks

D. Acquisition Strategy

PdM Waveforms is responsible for common core activities including developing and updating legacy and analyzing advance network 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 FY19, while maintaining legacy networking waveforms, PdM Waveforms implemented a pivoting strategy which focuses on vetting and analyzing commercial/ NDI waveforms. The Product Office has established great working relationships with Industry Partners within the waveform market. The strategy consist of conducting upfront analysis on commercial waveforms to inform Senior Leaders before a porting decision is made.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / *Joint Tactical Network (JTN)*	Project (Number/Name) EX6 / *Waveforms*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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	0.550	Jan 2020	-		0.550	Continuing	Continuing	Continuing
Program Management Support - MITRE	MIPR	MITRE : Aberdeen, MD	0.561	-		-		-		-		-	0.000	0.561	Continuing
Program Management Support - SETA	MIPR	Booz Allen Hamilton & Engeering Solutions & Products LLC : Riverside MD/ Chantilly, VA	-	2.788		2.513	Nov 2018	2.588	Nov 2019	-		2.588	Continuing	Continuing	Continuing
		Subtotal	0.793	3.772		3.052		3.138		-		3.138	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development-SRW/WREN	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		6.619		-		6.619	Continuing	Continuing	Continuing
Software Development - Technical/Coding (MA-IDIQ)	C/CPAF	MA - IDIQ : Various Locations	-	12.434		13.283		5.721		-		5.721	Continuing	Continuing	Continuing
Software Development - SSC LANT	MIPR	SSC LANT : Charleston, SC	-	1.253		1.329		-		-		-	Continuing	Continuing	Continuing
FY 2019 SBIR & STTR Transfer	TBD	TBD : TBD	-	-		1.128		-		-		-	Continuing	Continuing	Continuing
		Subtotal	3.492	19.803		22.229		12.340		-		12.340	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / *Joint Tactical Network (JTN)*	Project (Number/Name) EX6 / *Waveforms*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Support - SRW/ WREN	MIPR	CERDEC : APG, MD	0.194	0.753		-		1.125		-		1.125	0.000	2.072	-
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	-	0.459		1.286		0.621		-		0.621	Continuing	Continuing	Continuing
Systems Engineering - SSC LANT	MIPR	SSC LANT : Charleston, SC	-	1.479		1.569		1.166		-		1.166	Continuing	Continuing	Continuing
		Subtotal	1.976	2.691		2.855		2.912		-		2.912	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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		2.220		-		2.220	Continuing	Continuing	Continuing
Test and Evaluation - SSC LANT	MIPR	SSC LANT : Charleston, SC	-	0.438		0.465		-		-		-	Continuing	Continuing	Continuing
Test and Evaluation - Commercial Waveforms	MIPR	SSC LANT : Charleston, SC	-	-		-		4.874		-		4.874	Continuing	Continuing	Continuing
		Subtotal	0.493	2.490		2.642		7.094		-		7.094	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605031A / *Joint Tactical Network (JTN)*	Project (Number/Name) EX6 / *Waveforms*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	6.754	28.756		30.778		25.484		-		25.484	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605031A / *Joint Tactical Network (JTN)*	**Project (Number/Name)** EX6 / *Waveforms*

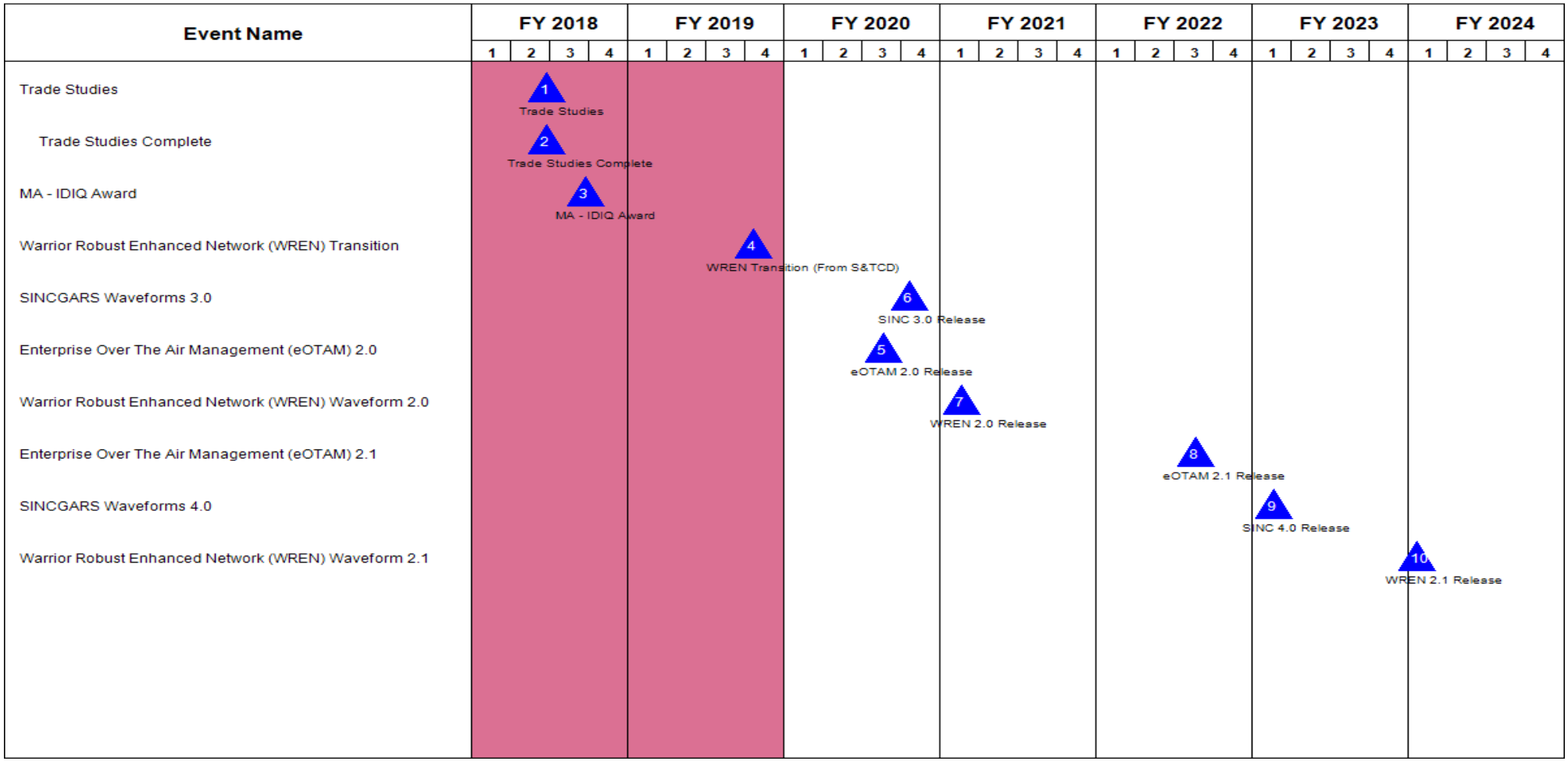

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605031A / *Joint Tactical Network (JTN)*	**Project (Number/Name)** EX6 / *Waveforms*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Trade Studies	2	2018	2	2018
Trade Studies Complete	2	2018	2	2018
MA - IDIQ Award	3	2018	3	2018
Warrior Robust Enhanced Network (WREN) Transition	4	2019	4	2019
SINCGARS Waveforms 3.0	4	2020	4	2020
Enterprise Over The Air Management (eOTAM) 2.0	3	2020	3	2020
Warrior Robust Enhanced Network (WREN) Waveform 2.0	1	2021	1	2021
Enterprise Over The Air Management (eOTAM) 2.1	3	2022	3	2022
SINCGARS Waveforms 4.0	1	2023	1	2023
Warrior Robust Enhanced Network (WREN) Waveform 2.1	1	2024	1	2024

Note

Warrior Robust Enhanced Network (WREN)

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605032A / *TRACTOR TIRE*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	118.570	107.926	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	226.496
ET3: *Tractor Trick*	-	118.570	107.926	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	226.496

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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	39.670	107.926	47.299	-	47.299
Current President's Budget	118.570	107.926	0.000	-	0.000
Total Adjustments	78.900	0.000	-47.299	-	-47.299
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	78.900	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-47.299	-	-47.299

Change Summary Explanation

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605033A *I Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	20.661	5.169	3.847	-	3.847	5.981	0.000	0.000	0.000	0.000	35.658
EQ3: *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*	-	20.661	5.169	3.847	-	3.847	5.981	0.000	0.000	0.000	0.000	35.658

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)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	5.207	5.175	6.794	-	6.794
Current President's Budget	20.661	5.169	3.847	-	3.847
Total Adjustments	15.454	-0.006	-2.947	-	-2.947
• Congressional General Reductions	-0.004	-0.006			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	15.662	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.204	-			
• Adjustments to Budget Years	-	-	-2.947	-	-2.947

Change Summary Explanation

FY 2018 variation due to $6 thousand for FFRDC and reduction of $204 thousand for SBIR/STTR.
FY 2018 increase of $15.454 million supports JUONS CC-0540 to address the Vehicle Borne Improvised Explosive Device (VBIED) threat. Additional capabilities are being developed and integrated into the current Integrated Base Defense Systems.
FY 2019 variation due to reduction of $195 thousand for SBIR/STTR.
FY 2020 decrease of $2.947 million is due to an adjustment required to align funding with planned acquisition strategy and test efforts.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605033A / *Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*	Project (Number/Name) EQ3 / *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EQ3: *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*	-	20.661	5.169	3.847	-	3.847	5.981	0.000	0.000	0.000	0.000	35.658
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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 2020 Base Funding in the amount of $3.847 million supports the continued development efforts for GBOSS-E to include the Technical Data Package (TDP) and Product Support Analysis for all system configurations. This funding also supports acquisition of Engineering Development Models. In addition, funding supports Developmental Testing, Limited User Testing (LUT) and program management activities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: GBOSS-E Design and Build	4.999	4.980	3.847
Description: GBOSS-E completes building of Prototype/Engineering Development Models (EDMs) and Development Testing (DT).			
FY 2019 Plans: FY 2019 Plans: 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			
FY 2020 Plans: FY 2020 Plans: Funding supports continued assembly/integration of EDMs and completion of DT and LUT.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605033A / *Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*	**Project (Number/Name)** EQ3 / *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY2019 to FY 2020 funding decrease is due to an adjustment required to align funding with planned acquisition strategy and test efforts. LRIP procurement and IOT&E efforts shifted into FY 2021.			
Title: CVBIED Design and Build	15.662	-	-
Title: FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer	-	0.189	-
Accomplishments/Planned Programs Subtotals	20.661	5.169	3.847

C. Other Program Funding Summary ($ in Millions)

N/A

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.

Milestone C is planned for FY 2021.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605033A / *Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*	**Project (Number/Name)** EQ3 / *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605033A / *Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*	**Project (Number/Name)** EQ3 / *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GBOSS-E Project Management	MIPR	PM FPS : Fort Belvoir, VA	1.112	0.821		0.763	May 2019	0.308	Jan 2020	-		0.308	Continuing	Continuing	-
CVBIED JUONS 0540 Project Management	MIPR	PM FPS : Fort Belvoir, VA	-	0.051		-		-		-		-	0.000	0.051	-
		Subtotal	1.112	0.872		0.763		0.308		-		0.308	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GBOSS-E Design Engineering	MIPR	NSWC Crane : Crane, IN	1.933	2.221		1.246	Feb 2019	2.257	Jan 2020	-		2.257	Continuing	Continuing	Continuing
GBOSS-E Software Development	TBD	TBD : TBD	0.263	-		-		-		-		-	Continuing	Continuing	Continuing
GBOSS-E Integration Support	MIPR	NSWC Crane : Crane, IN	1.125	-		0.419	Feb 2019	0.464	Jan 2020	-		0.464	Continuing	Continuing	Continuing
Tech Data	MIPR	NSWC Crane : Crane, IN	-	-		1.194	Feb 2019	-		-		-	Continuing	Continuing	Continuing
CVBIED JUONS 0540 Wide Area Motion Imagery Sensor Development	MIPR	NAVAIR : Patuxent River, MD	-	7.208		-		-		-		-	0.000	7.208	-
CVBIED JUONS 0540 Wide Area Motion Imagery Sensor Development	MIPR	RDECOM : Fort Belvoir, VA	-	8.735		-		-		-		-	0.000	8.735	-
Prototype Development	MIPR	NSWC Crane : Crane Indiana	-	-		0.735	Feb 2019	-		-		-	Continuing	Continuing	Continuing
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.189		-		-		-	0.000	0.189	-
		Subtotal	3.321	18.164		3.783		2.721		-		2.721	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605033A / *Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*	Project (Number/Name) EQ3 / *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GBOSS-E Design Support	MIPR	RDECOM CERDEC : Fort Belvoir, VA	0.310	0.105		0.107	Jan 2019	0.109	Jan 2020	-		0.109	Continuing	Continuing	Continuing
ARL Human Systems Integration Support	MIPR	US Army ARL : Adelphi, MD	0.025	0.029		0.030	Feb 2019	0.030	Nov 2019	-		0.030	Continuing	Continuing	Continuing
CECOM FSD - Safety	MIPR	CECOM : APG, MD	0.025	0.029		0.030	Feb 2019	0.030	Nov 2019	-		0.030	Continuing	Continuing	Continuing
Acquisiton / Logistics Support	MIPR	Various : Various	-	-		-		0.507	Mar 2020	-		0.507	0.000	0.507	-
		Subtotal	0.360	0.163		0.167		0.676		-		0.676	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
GBOSS-E Test and Evaluation	MIPR	ATEC : Aberdeen Proving Ground, MD	0.045	0.284		0.456		0.142	Jan 2020	-		0.142	Continuing	Continuing	Continuing
JUONS CC-0540 Test and Evaluation Support	MIPR	ATEC : Aberdeen Proving Ground, MD	-	1.178		-		-		-		-	0.000	1.178	-
		Subtotal	0.045	1.462		0.456		0.142		-		0.142	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	4.838	20.661		5.169		3.847		-		3.847	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605033A / *Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*	**Project (Number/Name)** EQ3 / *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*

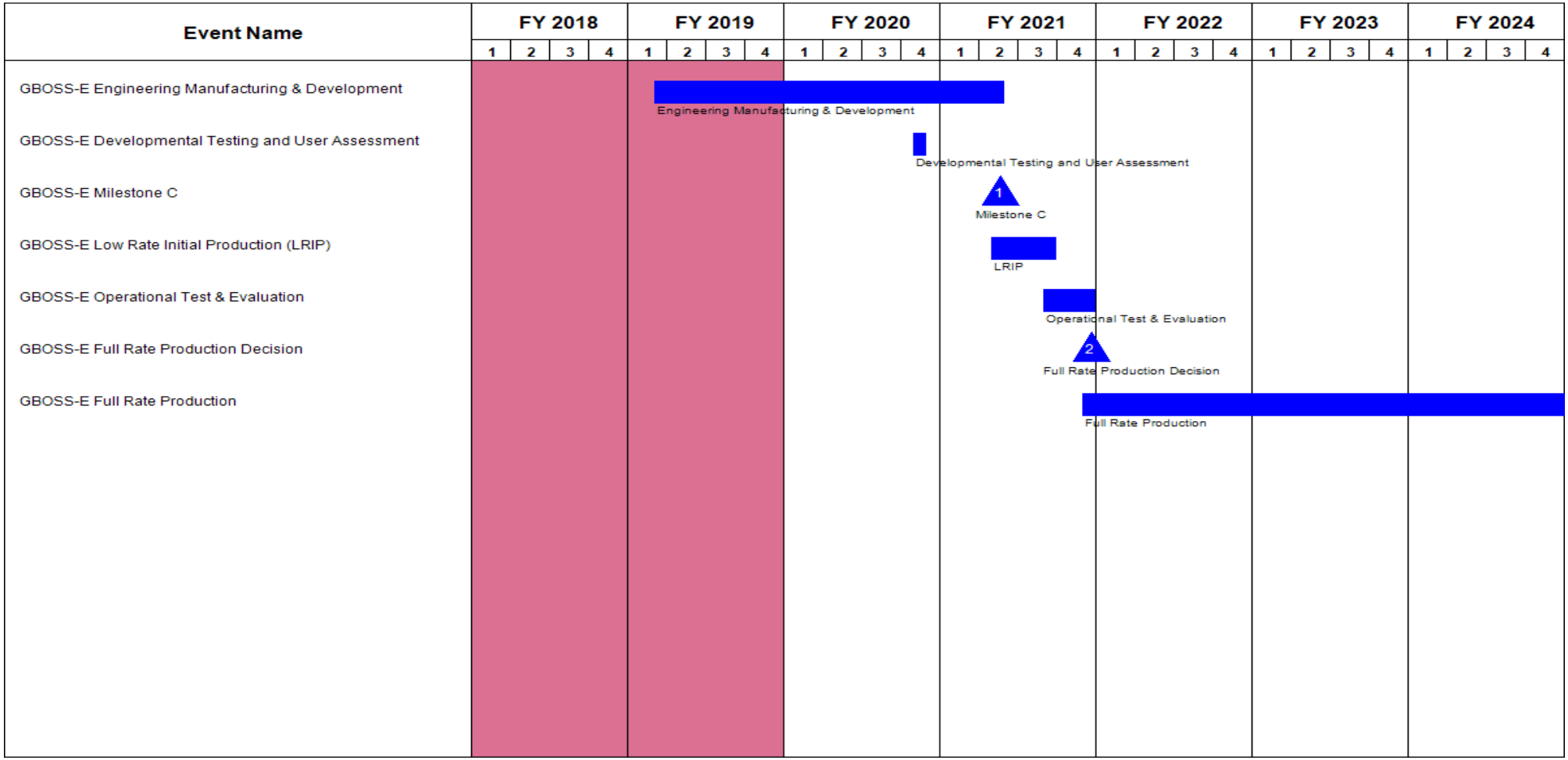

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605033A / *Ground-Based Operational Surveillance System - Expeditionary (GBOSS-E)*	**Project (Number/Name)** EQ3 / *Grnd-Based Opnl Surv Sys -Exped (GBOSS-E)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
GBOSS-E Risk Reduction	1	2016	4	2017
GBOSS-E Engineering Manufacturing & Development	1	2019	2	2021
GBOSS-E Developmental Testing and User Assessment	4	2020	4	2020
GBOSS-E Milestone C	2	2021	2	2021
GBOSS-E Low Rate Initial Production (LRIP)	2	2021	3	2021
GBOSS-E Operational Test & Evaluation	3	2021	4	2021
GBOSS-E Full Rate Production Decision	4	2021	4	2021
GBOSS-E Full Rate Production	4	2021	4	2025

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army												Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605034A / *Tactical Security System (TSS)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	3.998	4.490	6.928	-	6.928	3.057	2.013	0.000	0.000	0.000	20.486
EQ4: *Tactical Security System (TSS)*	-	3.998	4.490	6.928	-	6.928	3.057	2.013	0.000	0.000	0.000	20.486

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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	4.727	4.496	6.400	-	6.400
Current President's Budget	3.998	4.490	6.928	-	6.928
Total Adjustments	-0.729	-0.006	0.528	-	0.528
• Congressional General Reductions	-0.004	-0.006			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.540	-			
• SBIR/STTR Transfer	-0.185	-			
• Adjustments to Budget Years	-	-	0.528	-	0.528

Change Summary Explanation

FY 2018 variation due to $4 thousand for FFRDC Reduction $185 thousand for SBIR/STTR.
FY 2019 variation due to reduction of $170 thousand for SBIR/STTR.
Increase to FY 2020 funding is due to an adjustment required to align funding with planned acquisition strategy.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605034A / *Tactical Security System (TSS)*	Project (Number/Name) EQ4 / *Tactical Security System (TSS)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EQ4: *Tactical Security System (TSS)*	-	3.998	4.490	6.928	-	6.928	3.057	2.013	0.000	0.000	0.000	20.486
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The 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 2020 Base Funding in the amount of $6.928 million supports the procurement of three Low Rate Initial Production (LRIP) Articles and conduct of Initial Operational Test and Evaluation (IOT&E).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: TSS Design and Build	3.998	4.326	6.928
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, achieves Milestone C decision, procures LRIP articles and completes IOT&E. ***FY 2019 Plans:*** TSS completes the Critical Design Review (CDR); completes building of the EDM; continues Technical Data Package, Product Support Analysis, and Package development; completes DT; and supports Program Management Office (PMO). ***FY 2020 Plans:*** TSS completes the Limited User Testing (LUT) and Logistics Demonstration, achieves Milestone C decision, procures three LRIP articles, and completes IOT&E. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase to FY 2020 funding is due to an adjustment required to align funding with planned acquisition strategy.			
Title: FY 2019 SBIR / STTR Transfer	-	0.164	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605034A / *Tactical Security System (TSS)*	**Project (Number/Name)** EQ4 / *Tactical Security System (TSS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer			
Accomplishments/Planned Programs Subtotals	3.998	4.490	6.928

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

TSS will eliminate the Non-Standard Equipment (NSE) currently used in the Force Protection Suite (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).

Tactical Security System (TSS) received Materiel Development Decision (MDD) approval on 6 January 2017. The acquisition concept and contracting strategy for TSS was approved on 30 April 2018 by the Milestone Decision Authority (MDA) 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 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). MS B was achieved on 29 October 2018.

Milestone C is planned for FY 2020.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605034A / *Tactical Security System (TSS)*	Project (Number/Name) EQ4 / *Tactical Security System (TSS)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSS Project Management	MIPR	PM FPS : Fort Belvoir, VA	0.020	0.516		0.527	May 2019	0.537	May 2020	-		0.537	Continuing	Continuing	-
		Subtotal	0.020	0.516		0.527		0.537		-		0.537	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSS Design	MIPR	Polaris Alpha : Fredericksburg, VA	1.000	1.874		2.206	Feb 2019	0.217	Jan 2020	-		0.217	Continuing	Continuing	Continuing
TSS Prototypes	MIPR	Polaris Alpha : Fredericksburg, VA	1.000	0.409		0.759	Feb 2019	3.592	Jan 2020	-		3.592	Continuing	Continuing	Continuing
TSS Software Development	TBD	MTEQ : Lorton, VA	0.772	0.100		-		-		-		-	0.000	0.872	Continuing
TSS Integration	MIPR	Polaris Alpha : Fredericksburg, VA	-	0.623		0.426	Feb 2019	0.747	Jan 2020	-		0.747	Continuing	Continuing	Continuing
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.164		-		-		-	0.000	0.164	-
		Subtotal	2.772	3.006		3.555		4.556		-		4.556	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSS Design Support	MIPR	RDECOM CERDEC : Fort Belvoir, VA	-	0.154		0.151	Feb 2019	0.154	Jan 2020	-		0.154	Continuing	Continuing	Continuing
ARL Human Systems Integration Support	MIPR	US Army Research Lab : Adelphi, MD	-	0.025		0.031	Feb 2019	-		-		-	0.000	0.056	Continuing
CECOM FSD - Safety	MIPR	CECOM : APG, MD	-	0.015		0.015	Feb 2019	0.015	Nov 2019	-		0.015	Continuing	Continuing	Continuing
		Subtotal	-	0.194		0.197		0.169		-		0.169	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605034A / *Tactical Security System (TSS)*	Project (Number/Name) EQ4 / *Tactical Security System (TSS)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TSS Test and Evaluation	MIPR	Army Evaluation Center : APG, MD	-	0.282		0.211	Mar 2019	1.666	Mar 2020	-		1.666	Continuing	Continuing	Continuing
		Subtotal	-	0.282		0.211		1.666		-		1.666	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.792	3.998		4.490		6.928		-		6.928	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605034A / *Tactical Security System (TSS)*	**Project (Number/Name)** EQ4 / *Tactical Security System (TSS)*

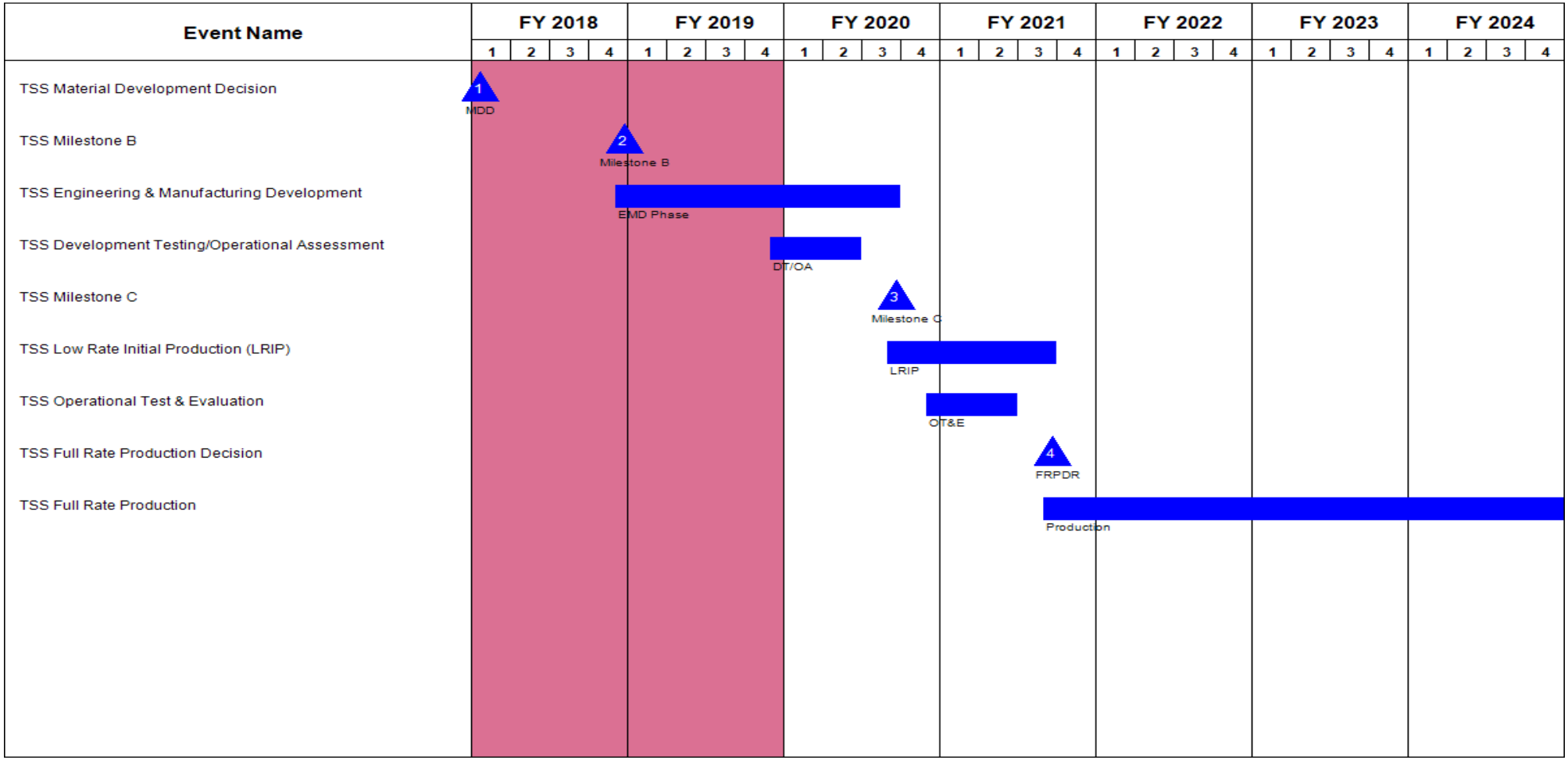

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605034A / *Tactical Security System (TSS)*	**Project (Number/Name)** EQ4 / *Tactical Security System (TSS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
TSS Material Development Decision	1	2018	1	2018
TSS Pre Milestone B Activities / Risk Reduction	2	2016	4	2017
TSS Milestone B	4	2018	4	2018
TSS Engineering & Manufacturing Development	4	2018	3	2020
TSS Development Testing/Operational Assessment	4	2019	2	2020
TSS Milestone C	3	2020	3	2020
TSS Low Rate Initial Production (LRIP)	3	2020	3	2021
TSS Operational Test & Evaluation	4	2020	2	2021
TSS Full Rate Production Decision	3	2021	3	2021
TSS Full Rate Production	3	2021	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army												Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605035A / *Common Infrared Countermeasures (CIRCM)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	97.746	33.809	34.488	11.770	46.258	36.078	7.143	11.272	5.103	0.000	237.409
EB4: *CIRCM*	-	97.746	33.809	34.488	11.770	46.258	36.078	7.143	11.272	5.103	0.000	237.409

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 Common Infrared Countermeasures Quick Reaction Capability (CIRCM QRC) approved Nov 2018.

CIRCM (EB4)
The 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 CIRCM QRC
As a part of Phase 2a of the JUONS (SO-0010) program, the Army has now integrated the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system onto the Apache, Blackhawk, and Chinook platforms. Due to a number of challenges, circumstances, and variables, the Army updated the ATW/CIRCM QRC and LIMWS Directed Requirements (dated 16 November 2018). The updated requirements extend the utilization of ATW DoN LAIRCM on conventional Army aircraft and cancel the need for the ATW/CIRCM QRC system for the conventional Army. (It should be noted that the updated requirement maintains the need for ATW/CIRCM on the Special Operations aircraft.) As a result, the Army will no longer acquire the ATW sensors for use in Phase 3 of the JUONS effort. Instead, the Army will accelerate the procurement of the CIRCM QRC systems for use with the currently fielded Common Missile Warning System (CMWS) in preparation for transition to the Limited Interim Missile Warning System (LIMWS) system when available.

FY 2020 Base Research, Development, Test, and Evaluation (RDT&E) funding in the amount of 34.488 million will fund development, integration and test activities.

FY 2020 RDT&E Overseas Contingency Operations (OCO) funding in the amount of $11.770 million will fund development, integration and test activities for JUONS QRC in support of Technology Applications Program Office (TAPO) and CMWS/CIRCM in support of conventional Army.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605035A / *Common Infrared Countermeasures (CIRCM)*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	127.318	53.848	46.445	-	46.445
Current President's Budget	97.746	33.809	34.488	11.770	46.258
Total Adjustments	-29.572	-20.039	-11.957	11.770	-0.187
• Congressional General Reductions	-0.065	-0.039			
• Congressional Directed Reductions	-26.400	-20.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.107	-			
• Adjustments to Budget Years	-	-	-11.957	11.770	-0.187

Change Summary Explanation

FY 2020 RDT&E Overseas Contingency Operations (OCO) funding increased to fund development, integration and test activities for CIRCM QRC.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	Project (Number/Name) EB4 / *CIRCM*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EB4: *CIRCM*	-	97.746	33.809	34.488	11.770	46.258	36.078	7.143	11.272	5.103	0.000	237.409
Quantity of RDT&E Articles	-	13	-	-	-	-	-	-	-	-		

Note

FY 2018 $9.99M purchased a quantity of 13 LRIP1 B-Kits. These 13 B-Kits are test assets for the EMD phase. The remaining FY 2018 funding was for development cost and testing.

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 Common Infrared Countermeasures Quick Reaction Capability (CIRCM QRC) approved in Nov 2018.

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 CIRCM QRC

As a part of Phase 2a of the JUONS (SO-0010) program, the Army has now integrated the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system onto the Apache, Blackhawk, and Chinook platforms. Due to a number of challenges, circumstances, and variables, the Army updated the ATW/CIRCM QRC and LIMWS Directed Requirements (dated 16 November 2018). The updated requirements extend the utilization of ATW DoN LAIRCM on conventional Army aircraft and cancel the need for the ATW/CIRCM QRC system for the conventional Army. (It should be noted that the updated requirement maintains the need for ATW/CIRCM on the Special Operations aircraft.) As a result, the Army will no longer acquire the ATW sensors for use in Phase 3 of the JUONS effort. Instead, the Army will accelerate the procurement of the CIRCM QRC systems for use with the currently fielded Common Missile Warning System (CMWS) in preparation for transition to the Limited Interim Missile Warning System (LIMWS) system when available.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	**Project (Number/Name)** EB4 / *CIRCM*

FY 2020 Base Research, Development, Test, and Evaluation (RDT&E) funding in the amount of $34.488 million will fund development, integration and test activities.

FY 2020 RDT&E Overseas Contingency Operations (OCO) funding in the amount of $11.770 million will fund development, integration and test activities for JUONS QRC in support of Technology Applications Program Office (TAPO) and CMWS/CIRCM in support of conventional Army.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: CIRCM Product Development ***Description:*** CIRCM Product Development, Support Costs, & Management Services ***FY 2019 Plans:*** RDT&E dollars support continued software and hardware development of B-Kits and A-Kits for the AH-64E and CH-47F platforms. ***FY 2020 Base Plans:*** FY 2020 base funding supports continuing development and integration activities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 funding increased to continue development and integration activities.	43.539	1.195	25.911	-	25.911
Title: CIRCM Test & Evaluation (T&E) ***Description:*** CIRCM Test & Evaluation (T&E) Activities ***FY 2019 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. ***FY 2020 Base Plans:*** RDT&E funding supports the completion of post Milestone C Initial Operational Test & Evaluation (IOT&E), and Threat & Vulnerability Analysis. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 funding requirements for testing decreased at the completion of IOT&E.	32.667	28.160	8.577	-	8.577
Title: Phase 3 CIRCM QRC OCO ***Description:*** Phase 3 CIRCM QRC Integration and Testing ***FY 2019 Plans:***	21.540	2.670	0.000	11.770	11.770

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	**Project (Number/Name)** EB4 / *CIRCM*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
RDT&E dollars supports integration and associated T&E efforts. This effort will integrate the ATW and CIRCM systems for TAPO and CWMS/CIRCM for conventional Army to reduce Space, Weight and Power - Cooling (SWaP-C) in support of Phase 3. ***FY 2020 Base Plans:*** OCO funding ***FY 2020 OCO Plans:*** Continue development and testing for CIRCM QRC. CIRCM QRC (Phase 3) is changing to maximize the Army fleet protection and meet operational requirements. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 RDT&E Overseas Contingency Operations (OCO) funding increased to fund development, integration and test activities for CIRCM QRC.					
Title: FY 2019 SBIR / STTR Transfer ***Description:*** FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer	-	1.784	-	-	-
Accomplishments/Planned Programs Subtotals	97.746	33.809	34.488	11.770	46.258

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• AZ3537: *Common Infrared Countermeasures (CIRCM)*	80.677	60.899	168.784	9.310	178.094	247.014	215.744	252.769	332.713	0.000	1,367.910

Remarks

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,

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	**Project (Number/Name)** EB4 / *CIRCM*

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 Northrop 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). CIRCM MS C was approved September 14, 2018, the LRIP and Engineering Support options were exercised and the program entered the Production & Deployment phase with First Unit Equipped (FUE) planned for third quarter of FY 2020, and a Full Rate Production Decision Review (FRPDR) planned for the third quarter of FY 2020.

Due to the urgency of addressing the Size, Weight, Power, and Cooling (SWaP-C) issues related to the Phase 2a JUONS SO-0010 DoN LAIRCM initial materiel solution, the Army approved a Directed Requirement for the Phase 3 ATW/CIRCM QRC (requirement updated in November 2018) which will be a sole source QRC effort with Northrop Grumman. Northrop Grumman has the required technical capabilities, knowledge and special equipment to meet the urgent and compelling need for the Phase 3 CIRCM QRC effort.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	Project (Number/Name) EB4 / *CIRCM*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineering Program Management	Various	Various : -	22.521	3.990		3.066	Oct 2018	2.639	Oct 2019	-		2.639	Continuing	Continuing	Continuing
CIRCM QRC System Engineering & Program Management	Various	Various : -	1.100	2.123		0.667		0.000		1.240	Oct 2019	1.240	Continuing	Continuing	Continuing
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		1.784		-		-		-	0.000	1.784	-
		Subtotal	23.621	6.113		5.517		2.639		1.240		3.879	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Non-recurring Engineering (NRE) - Multi Platform A-Kit Development & Integration	C/CPFF	Various : -	56.913	21.489		1.000	Jun 2019	16.901	Jun 2020	-		16.901	Continuing	Continuing	Continuing
Prototyping	C/FPIF	Various : -	25.334	9.993		-		1.860		-		1.860	Continuing	Continuing	Continuing
Other - Threat Management	Various	Various : -	23.676	7.179		2.299	Mar 2019	7.150		-		7.150	Continuing	Continuing	Continuing
Data - Logistics Support	Various	Various : -	0.705	0.300		-		-		-		-	Continuing	Continuing	Continuing
CIRCM QRC NRE	C/CPFF	Various : -	3.280	3.231		-		-		-		-	Continuing	Continuing	Continuing
CIRCM QRC Prototyping	C/CPFF	Various : -	2.120	-		-		-		-		-	Continuing	Continuing	Continuing
CIRCM QRC A-Kit Development & Integration	Various	Various : -	22.390	5.385		0.668		-		-		-	Continuing	Continuing	Continuing
CIRCM QRC Software Modeling & Simulation	Various	Various : Various	-	-		-		0.000		3.510	Jan 2020	3.510	Continuing	Continuing	Continuing
		Subtotal	134.418	47.577		3.967		25.911		3.510		29.421	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	Project (Number/Name) EB4 / *CIRCM*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Support Equipment	Various	Various : -	5.046	0.517		-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	5.046	0.517		-		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government System Test and Evaluation / IOT&E	Various	Various : -	90.407	28.082		20.691	Apr 2019	-		-		-	Continuing	Continuing	Continuing
Other Testing - Threat Assets	Various	Various : -	30.992	4.655		2.299	May 2019	5.938		-		5.938	Continuing	Continuing	Continuing
CIRCM QRC Government Integration, System Test & Evaluation	Various	Various : -	6.010	10.802		1.335		0.000		7.020	Jan 2020	7.020	Continuing	Continuing	Continuing
		Subtotal	127.409	43.539		24.325		5.938		7.020		12.958	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	290.494	97.746		33.809		34.488		11.770		46.258	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	**Project (Number/Name)** EB4 / *CIRCM*

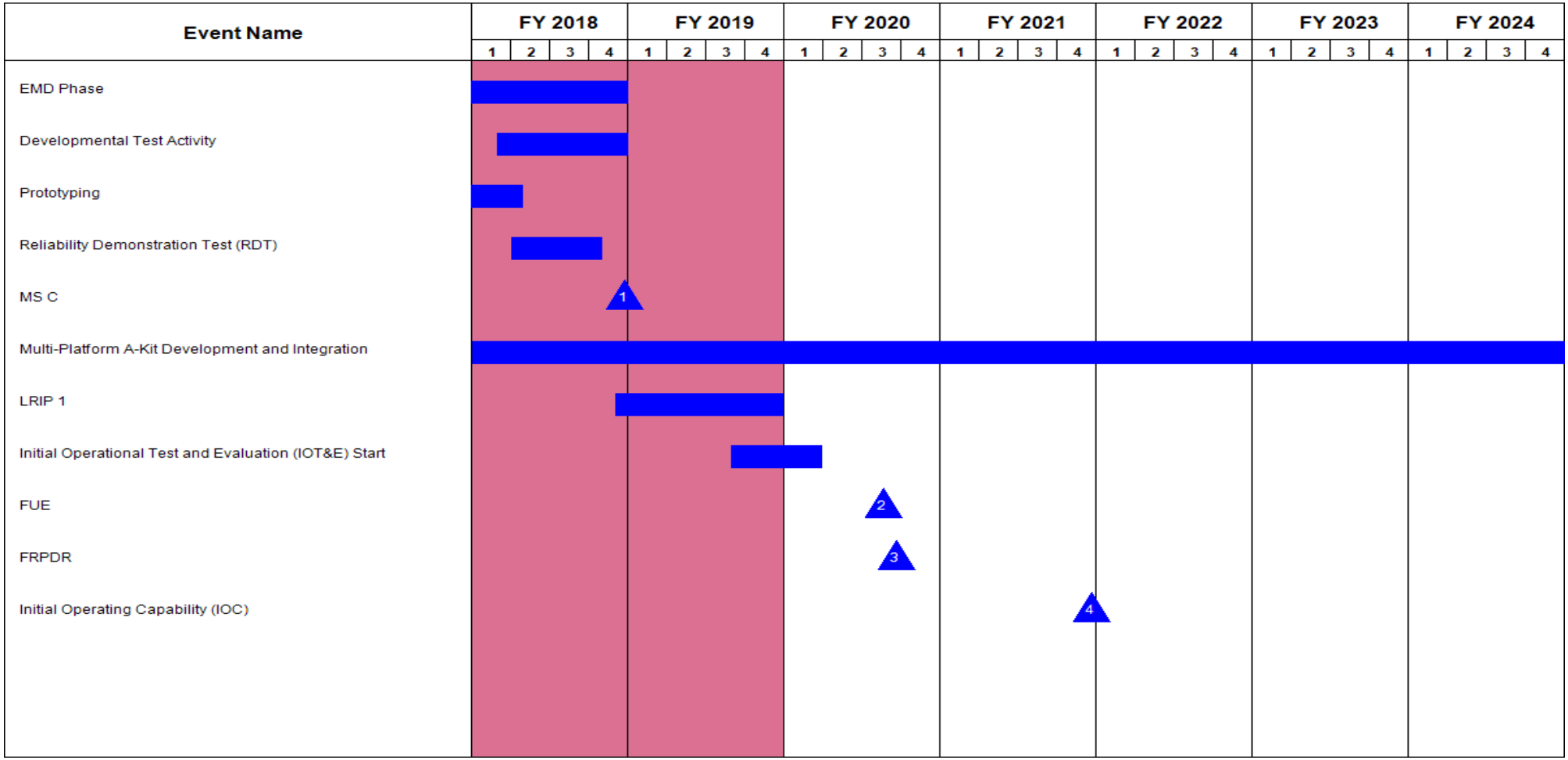

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605035A / *Common Infrared Countermeasures (CIRCM)*	**Project (Number/Name)** EB4 / *CIRCM*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
EMD Phase	4	2015	4	2018
Developmental Test Activity	1	2016	4	2018
Prototyping	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	1	2015	4	2027
LRIP 1	4	2018	4	2019
Initial Operational Test and Evaluation (IOT&E) Start	3	2019	1	2020
FUE	3	2020	3	2020
FRPDR	3	2020	3	2020
Initial Operating Capability (IOC)	4	2021	4	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605036A *I Combating Weapons of Mass Destruction (CWMD)*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	6.650	11.297	10.000	-	10.000	0.000	0.000	0.000	0.000	0.000	27.947
EQ5: *Combating Weapons of Mass Destruction (CWMD)*	-	6.650	11.297	10.000	-	10.000	0.000	0.000	0.000	0.000	0.000	27.947

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 MRDS program will replace low density legacy COTS equipment while providing new equipment to much of the Chemical Biological RN (CBRN) force. The Joint Personal Dosimeter (JPD-I) is intended to replace Army's legacy dosimeters (Army's PDR-75A 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. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	6.927	11.311	8.919	-	8.919
Current President's Budget	6.650	11.297	10.000	-	10.000
Total Adjustments	-0.277	-0.014	1.081	-	1.081
• Congressional General Reductions	-0.006	-0.014			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.271	-			
• Adjustments to Budget Years	-	-	1.081	-	1.081

Change Summary Explanation

FY 2020 increase in the amount of $1.081M is attributable to accelerating the program to reach production 12 months earlier.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	Project (Number/Name) EQ5 / *Combating Weapons of Mass Destruction (CWMD)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EQ5: *Combating Weapons of Mass Destruction (CWMD)*	-	6.650	11.297	10.000	-	10.000	0.000	0.000	0.000	0.000	0.000	27.947
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program transitioned to the Production and Deployment stage in FY19.

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 MRDS program will replace low density legacy COTS equipment while providing new equipment to much of the Chemical Biological RN (CBRN) force. The Joint Personal Dosimeter (JPD-I) is intended to replace Army's legacy dosimeters (Army's PDR-75A 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. 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 2018	FY 2019	FY 2020
Title: Program Management - MRDS	2.198	2.202	2.700
Description: Provide Program Management ***FY 2019 Plans:*** Continue Government program management and Integrated Product Team support. ***FY 2020 Plans:*** Continue Government program management and Integrated Product Team support. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Projecting wage increase for cost of living and within-grade promotions			
Title: Test & Evaluation Planning - MRDS	0.278	0.398	0.419
Description: Provides test & evaluation support (ATEC/OTC). ***FY 2019 Plans:***			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	**Project (Number/Name)** EQ5 / *Combating Weapons of Mass Destruction (CWMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Conduct test and review/approve detail test plans ***FY 2020 Plans:*** Prepare Initial Operational Test & Evaluation (IOT&E) planning and review/approve detail test plans. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to more support from United States Army Operational Test Command for the IOT&E.			
Title: System Engineering - MRDS ***Description:*** Provide system engineering support to the MRDS program. ***FY 2019 Plans:*** Provide system engineering support to the MRDS program. ***FY 2020 Plans:*** Provide system engineering support to the MRDS program ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Manpower increases due to simultaneous field and test system in FY20 while preparing for FRP decision.	0.437	0.455	0.657
Title: Cybersecurity/Integration - MRDS ***Description:*** Provides cybersecurity thru integration of COTS. ***FY 2019 Plans:*** Continue work on the Situational Awareness Tool and Networking capability through validation testing ***FY 2020 Plans:*** Conduct updates to the software to address findings in validation test and conduct re-test as needed. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Software labor cost increases and need to conduct verification testing. Key Performance Parameter requirement of MRDS	0.540	0.563	1.813
Title: Acquisition Logistics - MRDS ***Description:*** Provides Acquisition Logistics support to the MRDS program. ***FY 2019 Plans:*** Continue work on the level of repair analysis, provisioning, Army standard training material and Army standard technical manuals. ***FY 2020 Plans:***	0.374	0.390	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	**Project (Number/Name)** EQ5 / *Combating Weapons of Mass Destruction (CWMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Finalize work on Army training and technical manuals. Use final products in testing and update material. Complete Log Maintenance Demo (LMD). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** LMD cost incurred with cost of updates			
Title: Analytical Support - MRDS ***Description:*** Provide analytical and technical support to the MRDS program. ***FY 2019 Plans:*** Provide support to the test by the COTS vendor. ***FY 2020 Plans:*** Provide IOT&E analytical support to the test by multiple vendors ***FY 2019 to FY 2020 Increase/Decrease Statement:*** IOT&E incurs cost by multiple organizations	-	0.247	0.536
Title: Procure LRIP Prototypes -MRDS ***Description:*** Purchases the systems ***FY 2019 Plans:*** Procure 12 COTS Systems (2 Types) to support operational testing and logistics evaluation. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The program will not require prototypes in 2020 since they are bought in 2019.	2.573	2.233	-
Title: Test Execution - MRDS ***Description:*** Provides testing of the systems. ***FY 2019 Plans:*** Continue radiological performance and environmental testing with LRIP prototypes. ***FY 2020 Plans:*** Conduct Initial Operational Test & Evaluation (IOT&E) of the system ***FY 2019 to FY 2020 Increase/Decrease Statement:***	0.250	3.395	3.375

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	**Project (Number/Name)** EQ5 / *Combating Weapons of Mass Destruction (CWMD)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
IOT&E is a single location event unlike testing in FY 2019 that were at multiple sites			
Title: Program Management JPD - I ***FY 2019 Plans:*** Provide Program Management - JPD-I ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program was funded for only one year's effort	-	0.360	-
Title: Test & Evaluation Planning JPD- I ***FY 2019 Plans:*** Conduct Final Operational Test and Evaluation - JPD-I ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Program was funded for only one year's effort	-	0.640	-
Title: FY 2019 SBIR / STTR Transfer ***Description:*** FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY19 SBIR/STTR Transfer realized in the year of execution	-	0.414	-
Accomplishments/Planned Programs Subtotals	6.650	11.297	10.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

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 contract for LRIP systems to support post Milestone C testing, and an indefinite delivery indefinite quantity fixed price contract for the full rate production task order. The level of

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	**Project (Number/Name)** EQ5 / *Combating Weapons of Mass Destruction (CWMD)*

technological maturity is such that MRDS entered the acquisition cycle from MDD at MS C (FY18). The program is working toward a Full Rate Production Decision in 4th Qtr FY20 concurrent with a Full Rate Production Contract Award.

The Joint Personal 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-I entered the acquisition cycle from MDD at MS C (FY18). A Full Rate Production Decision in 1st Qtr FY19 was made concurrent with a Full Rate Production Contract Award.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	Project (Number/Name) EQ5 / *Combating Weapons of Mass Destruction (CWMD)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Allot	Various : Various	0.298	2.198	Dec 2017	2.202	Dec 2018	2.700	Dec 2019	-		2.700	0.000	7.398	-
Acquisition Document Development	Allot	Various : Various	0.180	-		-		-		-		-	0.000	0.180	-
		Subtotal	0.478	2.198		2.202		2.700		-		2.700	0.000	7.578	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contract Award	C/FFP	TBD : TBD	-	2.573	Sep 2018	2.733	Feb 2019	-		-		-	0.000	5.306	-
		Subtotal	-	2.573		2.733		-		-		-	0.000	5.306	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cybersecurity	MIPR	Edgewood Chemical and Biological Center : Edgewood, Maryland	0.200	0.540	Jan 2018	0.563	Jan 2019	1.813	Jan 2020	-		1.813	0.000	3.116	-
Acquisition Logistics	MIPR	Communications-Electronics Command : Aberdeen Proving Ground, MD	0.300	0.374	Jan 2018	0.390	Jan 2019	0.500	Jan 2020	-		0.500	0.000	1.564	-
Analytical Support	MIPR	Various : Various	0.470	-		0.247	Jan 2019	0.536	Jan 2020	-		0.536	0.000	1.253	-
Systems Engineering	MIPR	Edgewood Chemical and Biological Center : Aberdeen Proving Ground, MD	0.470	0.437	Jan 2018	0.455	Jan 2019	0.657	Jan 2020	-		0.657	0.000	2.019	-
FY 2019 SBIR / STTR Transfer	TBD	Headquarters, Department of the	-	-		0.414	Jan 2019	-		-		-	0.000	0.414	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	Project (Number/Name) EQ5 / *Combating Weapons of Mass Destruction (CWMD)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		Army : Washington, DC													
		Subtotal	1.440	1.351		2.069		3.506		-		3.506	0.000	8.366	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T&E	MIPR	ATEC : Aberdeen Proving Ground, MD	0.090	0.278	Dec 2017	0.398	Dec 2018	0.419	Dec 2019	-		0.419	0.000	1.185	-
Component testing	MIPR	Various : Various	-	0.250	Feb 2018	3.895	Feb 2019	3.375	Feb 2020	-		3.375	0.000	7.520	-
		Subtotal	0.090	0.528		4.293		3.794		-		3.794	0.000	8.705	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2.008	6.650		11.297		10.000		-		10.000	0.000	29.955	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	**Project (Number/Name)** EQ5 / *Combating Weapons of Mass Destruction (CWMD)*

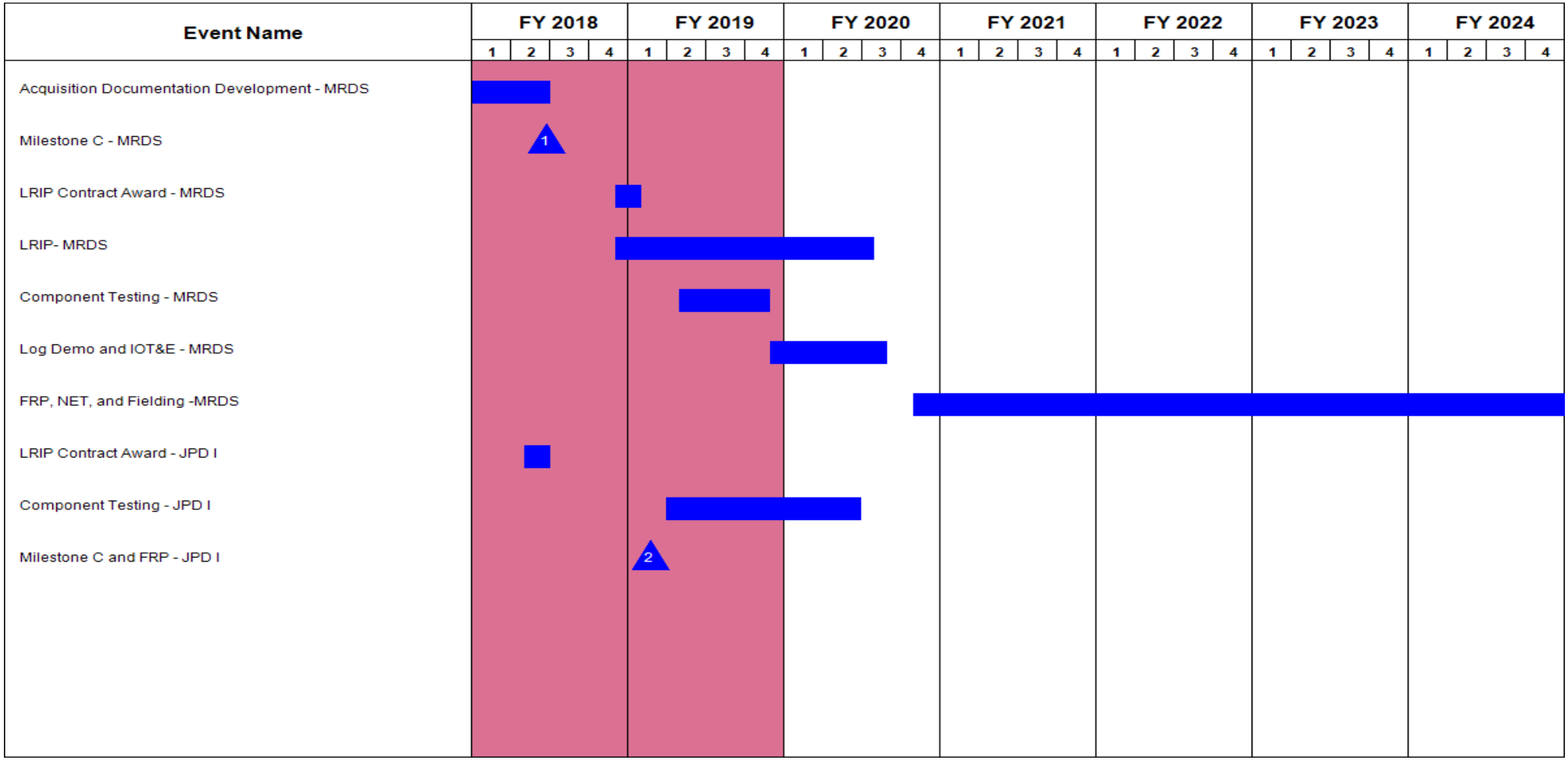

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605036A / *Combating Weapons of Mass Destruction (CWMD)*	**Project (Number/Name)** EQ5 / *Combating Weapons of Mass Destruction (CWMD)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Acquisition Documentation Development - MRDS	1	2017	2	2018
Developmental Testing - MRDS	3	2017	4	2017
Milestone C - MRDS	2	2018	2	2018
LRIP Contract Award - MRDS	4	2018	1	2019
LRIP- MRDS	4	2018	3	2020
Component Testing - MRDS	2	2019	4	2019
Log Demo and IOT&E - MRDS	4	2019	3	2020
FRP, NET, and Fielding -MRDS	4	2020	4	2026
LRIP Contract Award - JPD I	2	2018	2	2018
Component Testing - JPD I	2	2019	2	2020
Milestone C and FRP - JPD I	1	2019	1	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605037A / *Evidence Collection and Detainee Processing*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	0.206	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.206
EQ6: *Evidence Collection and Detainee Processing*	-	0.206	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.206

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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.214	0.000	0.000	-	0.000
Current President's Budget	0.206	0.000	0.000	-	0.000
Total Adjustments	-0.008	0.000	0.000	-	0.000
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.008	-			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605037A / *Evidence Collection and Detainee Processing*	Project (Number/Name) EQ6 / *Evidence Collection and Detainee Processing*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EQ6: *Evidence Collection and Detainee Processing*	-	0.206	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	0.206
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

There is no FY 2019 or FY2020 funding Request.

Note: FY 2018 is the first and only year PEO Soldier will receive these funds.
This funding supports engineering and manufacturing development of Law Enforcement Equipment Ensemble Kit (LEEK). LEEK 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 2018	FY 2019	FY 2020
Title: LEEK ***Description:*** This funding supports engineering and manufacturing development of Law Enforcement Equipment Ensemble Kit (LEEK). LEEK consists of the following: Duty Belt, Belt Keeper, Pouch Handcuff, Surgical Glove Pouch and Flashlight Holder to be used by Military Law Enforcement personnel.	0.206	-	-
Accomplishments/Planned Programs Subtotals	0.206	-	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605037A / *Evidence Collection and Detainee Processing*	Project (Number/Name) EQ6 / *Evidence Collection and Detainee Processing*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Purchase COTS test items	C/FFP	TBD : TBD	-	0.100		-		-		-		-	0.000	0.100	-
		Subtotal	-	0.100		-		-		-		-	0.000	0.100	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
User Evaluation/ Interoperability, Durability and Shade evals	MIPR	TBD : TBD	-	0.106		-		-		-		-	0.000	0.106	-
		Subtotal	-	0.106		-		-		-		-	0.000	0.106	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	0.206		0.000		-		-		-	0.000	0.206	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605037A / *Evidence Collection and Detainee Processing*	**Project (Number/Name)** EQ6 / *Evidence Collection and Detainee Processing*

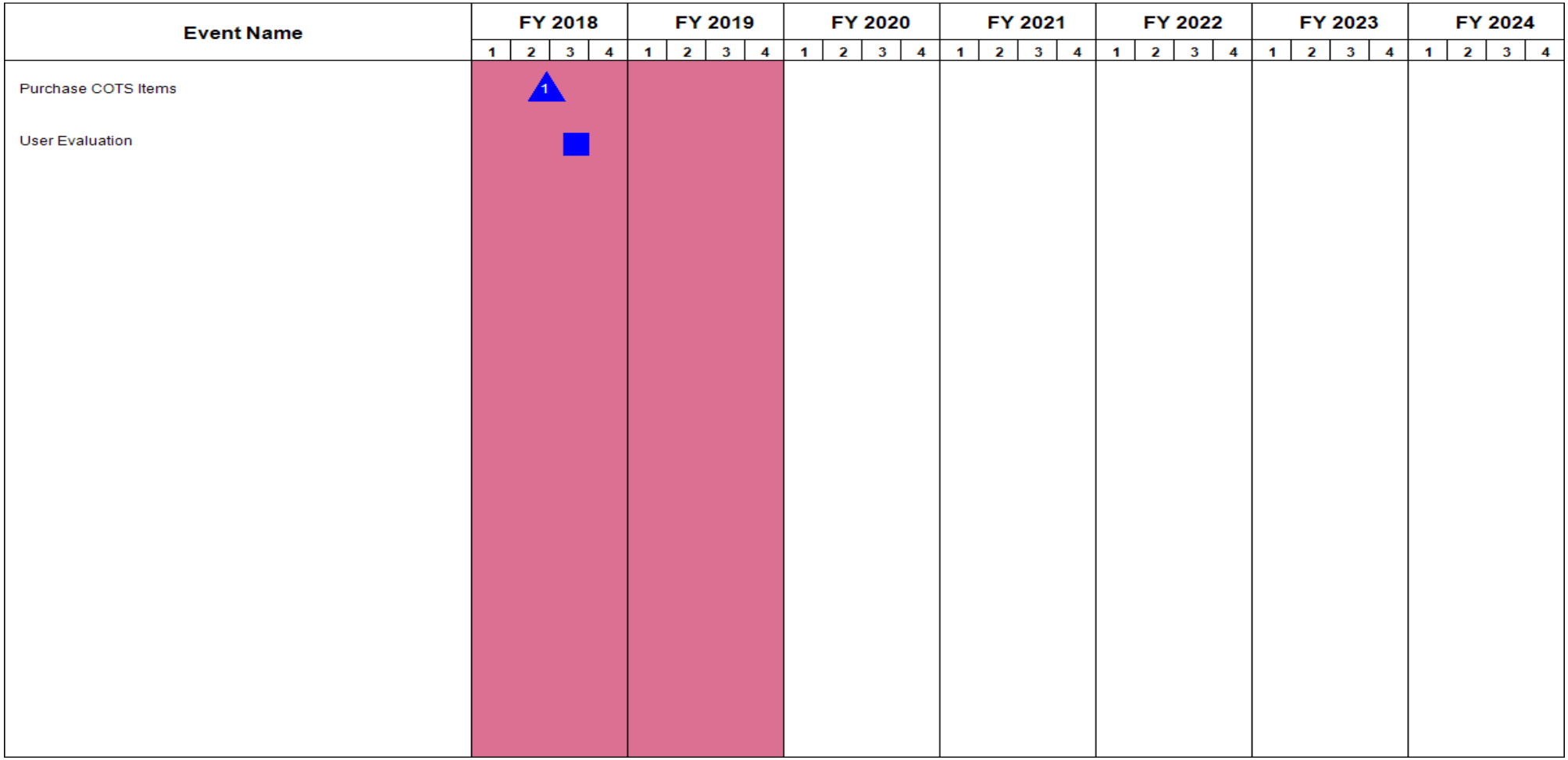

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605037A / *Evidence Collection and Detainee Processing*	**Project (Number/Name)** EQ6 / *Evidence Collection and Detainee Processing*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Purchase COTS Items	2	2018	2	2018
User Evaluation	3	2018	3	2018

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605038A *I Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	15.481	15.135	6.054	-	6.054	0.000	0.000	0.000	0.000	0.000	36.670
EQ7: *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*	-	15.481	15.135	6.054	-	6.054	0.000	0.000	0.000	0.000	0.000	36.670

A. Mission Description and Budget Item Justification

The Nuclear, Biological, and Chemical Reconnaissance Vehicles (NBCRV) Sensor Suite Upgrade (SSU) provides maneuver formations the ability to conduct mounted reconnaissance and surveillance missions of CBRN named areas of interest (NAIs). The NBCRV SSU will answer the commander's priority intelligence requirements (PIR), and facilitate proactive risk-based decisions to ensure freedom of action and survivability. A modern and capable NBCRV SSU is a critical component for Joint Force success when operating in the complex CBRN environment. Operating with combat vehicles fighting against increasingly capable and determined enemies requires like capability with regard to protection, mobility, and lethality. The NBCRV SSU will accomplish this by integrating the capability for command and control of unmanned systems with CBRN payload. The NBCRV SSU will provide a CBRN detection, tipping and queueing to accomplish desired standoff distances to keep the warfighter out of harm's way 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.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	16.125	17.154	5.985	-	5.985
Current President's Budget	15.481	15.135	6.054	-	6.054
Total Adjustments	-0.644	-2.019	0.069	-	0.069
• Congressional General Reductions	-0.013	-0.019			
• Congressional Directed Reductions	-	-2.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.631	-			
• Adjustments to Budget Years	-	-	0.069	-	0.069

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605038A / *Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*	Project (Number/Name) EQ7 / *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EQ7: *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*	-	15.481	15.135	6.054	-	6.054	0.000	0.000	0.000	0.000	0.000	36.670
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Nuclear, Biological, and Chemical Reconnaissance Vehicles (NBCRV) Sensor Suite Upgrade (SSU) provides maneuver formations the ability to conduct mounted reconnaissance and surveillance missions of CBRN named areas of interest (NAIs). The NBCRV SSU will answer the commander's priority intelligence requirements (PIR), and facilitate proactive risk-based decisions to ensure freedom of action and survivability. A modern and capable NBCRV SSU is a critical component for Joint Force success when operating in the complex CBRN environment. Operating with combat vehicles fighting against increasingly capable and determined enemies requires like capability with regard to protection, mobility, and lethality. The NBCRV SSU will accomplish this by integrating the capability for command and control of unmanned systems with CBRN payload. The NBCRV SSU will provide a CBRN detection, tipping and queueing to accomplish desired standoff distances to keep the warfighter out of harm's way 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 FY20, NBCRV SSU program will develop a prototype of integrated sensors for demonstration in Joint Warfighter Assessment 2020.

Note: FY 2016-FY 2017 funded under 0603627A E79, Smoke, Obscurant and Target Defeating Sys-Adv Dev.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Product Development and Unmanned Platform Integration	13.743	12.778	5.254
Description: Development of CSD, radiological detectors, standoff chemical vapor detector, unmanned platform identification and integration, Government strategic planning, system engineering, logistics, training, and Integrated Product Team (IPT) support.			
FY 2019 Plans: Continued CBRN sensor and integrated sensor suite prototype development, maturation, and procurement. Continued government strategic planning, systems engineering, logistics, training, test and evaluation, and technical support. Initiated NBCRV SSU acceleration effort with the bulk of integration product development occurring in FY20.			
FY 2020 Plans: Continued CBRN sensor and integrated sensor suite prototype development, maturation, and procurement. Continued government strategic planning, systems engineering, logistics, training, test and evaluation, technical support, and the bulk of integration product development for the acceleration of the program.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605038A / *Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*	**Project (Number/Name)** EQ7 / *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Funding increase in FY19 is due to continued acceleration efforts to meet JWAs, where FY20 funding is decreased due to program schedule and level of effort required			
Title: Program Management and Oversight ***Description:*** Program Management and Oversight ***FY 2019 Plans:*** Continue Government program management, system engineering, and Integrated Product Team (IPT) support. ***FY 2020 Plans:*** Continue Government program management, system engineering, and Integrated Product Team (IPT) support. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding is decrease commensurate to the level of effort required.	1.738	1.739	0.800
Title: FY19 SBIR/STTR Transfer ***FY 2019 Plans:*** ABO database not correctly pushing SBIR/STTR info, so added a line to address ***FY 2019 to FY 2020 Increase/Decrease Statement:*** ABO database not correctly pushing SBIR/STTR info, so added a line to address	-	0.618	-
Accomplishments/Planned Programs Subtotals	15.481	15.135	6.054

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Nuclear Biological Chemical Reconnaissance Vehicle Sensor Suite Upgrade (NBCRV SSU) is an upgrade for the Stryker NBCRV. The acquisition strategy for the Stryker NBCRV SSU is to integrate mature sensors into the Stryker NBCRV in FY19 for demonstration in Joint Warfighting Assessment (JWA) 19 and system level testing FY 2019. Following the testing and demonstration, the hardware and software will be fixed and updated for demonstration in JWA 20 and test in FY 2020. An In Progress Review will be held in late FY 2020 to execute a Modification Work Order for fielding in FY 2021. This schedule was accelerated from the previous schedule based on the maturity of the sensor and guidance from the Chief of Staff of the Army. The NBCRV SSU program will conduct system level testing in FY 2021 using Defense Wide funding after the Modification Work Order In Process Review to ensure system performance.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605038A / *Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*	**Project (Number/Name)** EQ7 / *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605038A / *Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*	Project (Number/Name) EQ7 / *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management Personnel	MIPR	JPEO-CBRND : Edgewood, MD	-	1.738	Nov 2017	1.739	Nov 2018	0.800	Nov 2019	-		0.800	Continuing	Continuing	Continuing
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.618	Oct 2018	-		-		-	0.000	0.618	-
		Subtotal	-	1.738		2.357		0.800		-		0.800	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development and Sensor Integration	C/Various	Various : Various	-	-		10.654	Jan 2019	4.754	Nov 2019	-		4.754	Continuing	Continuing	Continuing
Product Development (CSD) AGENTASE, LLC (TMRR)	Option/ CPFF	AGENTASE, LLC : Elkridge, MD	-	2.552	Jan 2018	0.393	Nov 2018	-		-		-	0.000	2.945	-
Product Development (CSD) L3 (TMRR)	Option/ CPFF	L-3 Communications Sonoma EO, Inc : Santa Rosa,, CA	-	2.627	Nov 2017	-		-		-		-	0.000	2.627	-
Product Development (CSD) UTC (TMRR)	Option/ CPFF	Hamilton Sundstand Space Systems : Pomona, CA	-	2.087	Nov 2017	-		-		-		-	0.000	2.087	-
Product Development (CSD) Rad/Nuc (M2PRDS)	C/CPFF	Advanced Technologies International : Summerville, SC	-	1.942	Jul 2018	-		-		-		-	0.000	1.942	-
Product Development (ECBC Matrix)	MIPR	ECBC : Aberdeen Proving Ground	-	2.259	Oct 2017	-		0.500	Oct 2019	-		0.500	0.000	2.759	-
Product Development Unmanned Platform Development and Integration	MIPR	Various : Various	-	0.645	Dec 2017	-		-		-		-	0.000	0.645	-
		Subtotal	-	12.112		11.047		5.254		-		5.254	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605038A / *Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*	**Project (Number/Name)** EQ7 / *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrated Logistics Support	MIPR	ECBC : Edgewood, MD	-	-		1.638	Nov 2018	-		-		-	Continuing	Continuing	Continuing
Requirements Development Support	Various	Various : Various	-	0.531	Nov 2017	0.093	Nov 2018	-		-		-	0.000	0.624	-
		Subtotal	-	0.531		1.731		-		-		-	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	ECBC : Edgewood, MD	-	1.100	Oct 2017	-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	-	1.100		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	15.481		15.135		6.054		-		6.054	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605038A / *Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*	**Project (Number/Name)** EQ7 / *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*

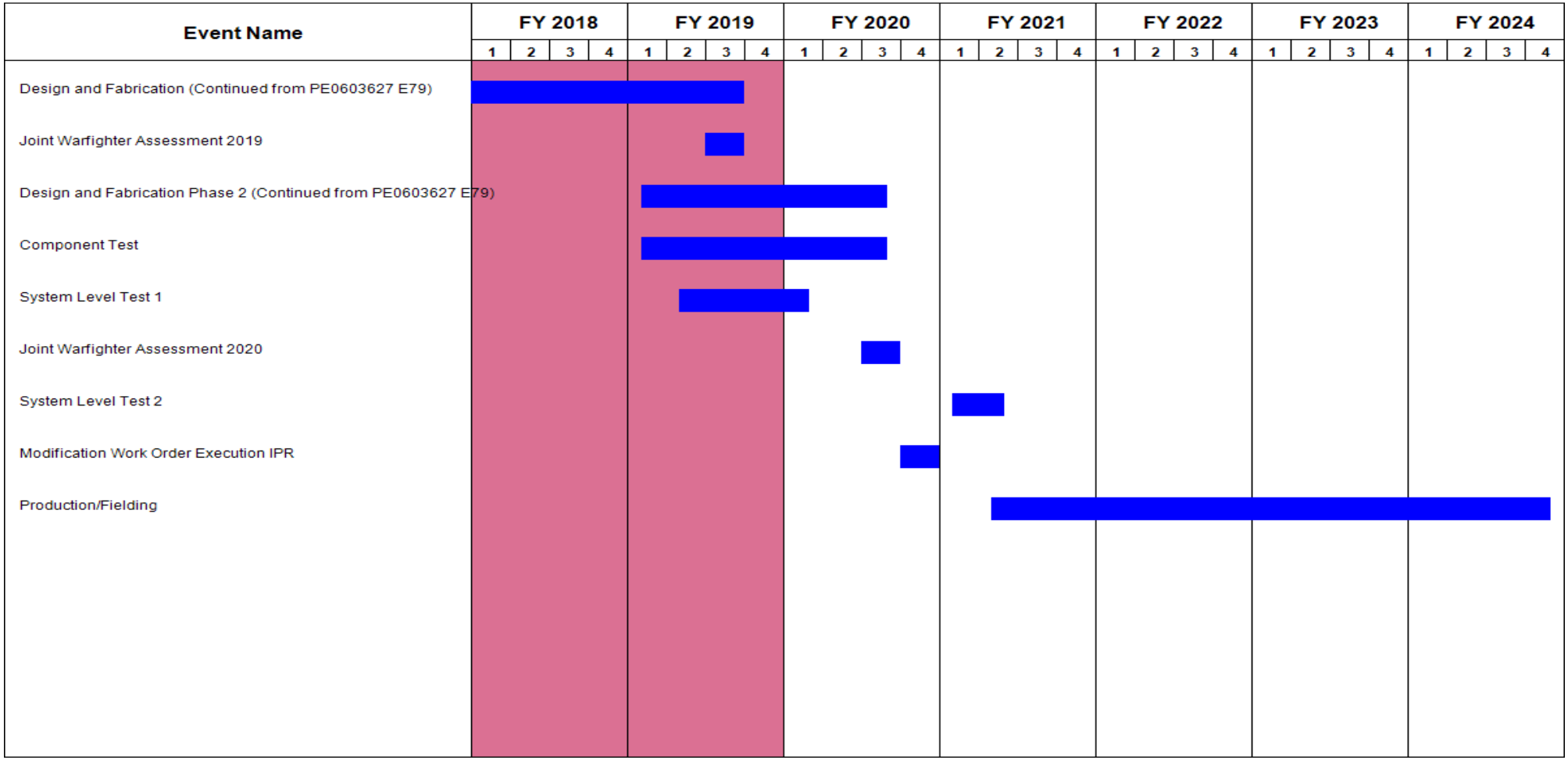

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605038A / *Nuclear Biological Chemical Reconnaissance Vehicle (NBCRV) Sensor Suite*	**Project (Number/Name)** EQ7 / *NBC Reconnaissance Vehicle (NBCRV) Sensor Suite*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Design and Fabrication (Continued from PE0603627 E79)	2	2017	3	2019
Joint Warfighter Assessment 2019	3	2019	3	2019
Design and Fabrication Phase 2 (Continued from PE0603627 E79)	1	2019	3	2020
Component Test	1	2019	3	2020
System Level Test 1	2	2019	1	2020
Joint Warfighter Assessment 2020	3	2020	3	2020
System Level Test 2	1	2021	2	2021
Modification Work Order Execution IPR	4	2020	4	2020
Production/Fielding	2	2021	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605041A / *Defensive CYBER Tool Development*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	41.441	33.796	62.262	-	62.262	29.738	92.873	94.974	90.000	0.000	445.084
CY5: *CYBER Situational Understanding*	-	0.000	0.000	20.183	-	20.183	0.000	0.000	0.000	0.000	0.000	20.183
EV5: *Defensive CYBER Operations*	-	41.441	33.796	42.079	-	42.079	29.738	92.873	94.974	90.000	0.000	424.901

Note

Project CY5 is a new start beginning in FY20.

A. Mission Description and Budget Item Justification

Defensive Cyber Tool Development (DCTD) and Cyber Situational Understanding (SU) fall within Line of Effort (LOE) 1 of the Network Modernization Strategy framework, which incorporates cyber capabilities that support the employment of the network as a weapon system.

Overall, Defensive Cyber Operations (DCO) and Cyber SU provide the tools and insight to proactively protect and defend the network at the tactical and strategic levels, thereby enabling the network to operate unfettered from the threat of cyberattacks.

CY5 Cyber SU:

Cyber SU supports Cyber Electromagnetic Activity (CEMA) operations by providing visualization of CEMA information to improve planning, coordination, integration and synchronization of cyberspace operations and unified land operations.

Cyber SU provides the Brigade to Corps commanders the visualization of physical (geographically), logical (at a specific network internet protocol), and cyber persona layers (bad actors, from individuals to nation states) of cyberspace based on data/information from multiple sources and sensors to produce a CEMA overlay on the commander's Common Operational Picture (COP) within the Command Post Computing Environment (CPCE). Supporting CEMA, Cyber SU synchronizes and integrates red (enemy), grey (commercial/private sector) and blue (friendly) cyberspace data, and enables collaboration at the tactical echelon. Further, in support of the Military Decision Making Process (planning and decision cycles), Cyber SU provides tactical commanders with a broad understanding of CEMA threats by informing the commander of any cyber related impacts to physical domains, unified land operations, and the overall mission.

EV5 DCO:

The DCO group of programs develops, assesses, deploys, learns, and iterates essential cyberspace warfighting capabilities consisting of solutions based upon an infrastructure, platform, and tool/payload approach. DCO capabilities are required in order to actively predict and conduct reconnaissance (search and discover) against advanced cyberspace threats (to include insider threats) and vulnerabilities that do not trigger or generate warnings using routine security measures. Additionally,

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605041A *I Defensive CYBER Tool Development*

DCO capabilities allow the Army to outmaneuver adversaries by performing preapproved, automated, agile, internal countermeasures that stop or mitigate cyberspace attacks. Moreover, DCO capabilities enable the Army to conduct cyberspace defense mission planning and protection that identifies and assures the availability of tasked critical assets and infrastructure supporting Army, DOD, host nation, and civil authority actions or missions. The overall objective is to achieve survivability of networks, IT platforms, and data through counter-mobility actions, dynamic movement of tasked critical assets, and security enhancement measures. This assures commanders from U.S. Army Cyber Command (ARCYBER) and other Army Service Component Commands Brigade through Corp down to the tactical level can execute national, joint, and/or Army operational and tactical missions. These capabilities enable ARCYBER to support U.S. Cyber Command (USCYBERCOM) and defend all Army networks as part of its Service-retained responsibilities. DCO capabilities also enable Army National Guard and Reserve forces to support USC Title 10 missions under the auspices of ARCYBER or other major commands.

DCO supports material solutions aligned to requirements outlined in the 26 October 2016 Joint Requirements Oversight Council (JROC) Defensive Cyberspace Operations Information Systems Initial Capabilities Document (IS ICD). DCO related infrastructure, platforms, and tools/payloads enable the Army to maneuver, conduct reconnaissance, execute counter-mobility actions, and command and control DCO people, processes, and technologies within friendly cyberspace. DCO programs will allow near real-time employment of passive and active measures to preserve the ability to utilize friendly cyberspace capabilities and protect data, networks, net-centric capabilities, and other designated systems. These programs directly support USCYBERCOM Integrated Priority List #2 Produce Advanced Cyberspace Infrastructure and #5 Defensive Forces to execute passive and active defense operations at net-speed.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	55.165	36.626	89.183	-	89.183
Current President's Budget	41.441	33.796	62.262	-	62.262
Total Adjustments	-13.724	-2.830	-26.921	-	-26.921
• Congressional General Reductions	-0.035	-			
• Congressional Directed Reductions	-12.000	-2.830			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.689	-			
• Adjustments to Budget Years	-	-	-26.921	-	-26.921

Change Summary Explanation

CY5 FY 2020 Base funding in the amount of $20.183 million was aligned to a new program element for Cyber Situational Understanding (SU).
EV5 FY 2019 Base funding in the amount of $2.830 million was decremented from the DCO program, as decided by the Joint APPN Conference due to prior year carryover.
EV5 FY 2020 Base funding in the amount of $26.921 million was reduced due to Army priorities.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605041A / *Defensive CYBER Tool Development*	Project (Number/Name) CY5 / *CYBER Situational Understanding*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
CY5: *CYBER Situational Understanding*	-	0.000	0.000	20.183	-	20.183	0.000	0.000	0.000	0.000	0.000	20.183
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Program Element CY5 is a new start beginning in FY20.

A. Mission Description and Budget Item Justification

Cyber SU falls within Line of Effort (LOE) 1 (Unified Network) of the Network Modernization Strategy framework, which incorporates cyber capabilities that support the employment of the network as a weapon system.

CY5 Cyber SU:

Cyber SU supports Cyber Electromagnetic Activity (CEMA) operations by providing visualization of CEMA information to improve planning, coordination, integration and synchronization of cyberspace operations and unified land operations.

Cyber SU provides the Brigade to Corps commanders the visualization of physical (geographically), logical (at a specific network internet protocol), and cyber persona layers (bad actors, from individuals to nation states) of cyberspace based on data/information from multiple sources and sensors to produce a CEMA overlay on the commander's Common Operational Picture (COP) within the Command Post Computing Environment (CPCE). Supporting CEMA, Cyber SU synchronizes and integrates red (enemy), grey (commercial/private sector) and blue (friendly) cyberspace data, and enables collaboration at the tactical edge. Further, in support of the Military Decision Making Process (planning and decision cycles), Cyber SU provides tactical commanders with a thorough understanding of CEMA threats by informing the commander of any cyber related impacts to physical domains, unified land operations, and the overall mission.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Development Engineering	-	-	15.148
Description: Decomposition of multiple Programs of Record (POR) requirements to initiate development of technical requirement, which will inform government-off-the-shelf (GOTS)/commercial-off-the-shelf (COTS) product evaluation for initial capability procurement and integration.			
FY 2020 Plans: FY20 funding will develop the necessary systems engineering/architecture products, middleware and back-end services required to establish an integration environment. In addition, FY20 funds will support software procurement and prototyping of candidate GOTS/COTS products to establish an initial Cyber SU capability to achieve Limited Deployment in FY20.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** CY5 / *CYBER Situational Understanding*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Program Executive Office Command, Control and Communications-Tactical will execute these funds. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** New start in FY20.			
Title: Systems Test and Evaluation ***Description:*** T&E efforts include the planning and execution of T&E events including Developmental Test, Software Acceptance Testing, Integration Events, Risk Reduction Events, and Initial User Test and Evaluation. ***FY 2020 Plans:*** FY20 funding will provide developmental testing and initial operational test support in preparation for a limited deployment in FY20. Program Executive Office Command, Control and Communications-Tactical will execute these funds. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** New start in FY20.	-	-	2.444
Title: Training ***Description:*** The development of training support products will be coordinated with the appropriate US Army Training and Doctrine Command (TRADOC) Capability Managers (TCM), US Army Cyber Command, PORs, and related organizations to develop applicable program of instruction. ***FY 2020 Plans:*** FY20 funding will provide the initial development for training philosophy, methods, and associated products to support a limited deployment in FY20. Program Executive Office Command, Control and Communications-Tactical will execute these funds. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** New start in FY20.	-	-	0.118
Title: Systems Engineering/Management ***Description:*** Systems Engineering/Management includes business, technical and logistical staff support and overall management of program execution, major events, reporting, funds execution and contract management.	-	-	2.473

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2020 Plans: FY20 funding will provide funding for program office staff (matrix and contractor) to perform duties necessary to develop, acquire/ procure, have a milestone decision review and field Limited Deployment in FY20. Program Executive Office Command, Control and Communications-Tactical will execute these funds. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** New start in FY20.			
Accomplishments/Planned Programs Subtotals	-	-	20.183

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

N/A

D. Acquisition Strategy

Cyber SU is an Information Technology (IT) Box program as outlined in the Cyberspace Situational Understanding (Cyber SU) Supporting Army Cyberspace Electromagnetic Activities (CEMA) Information Systems Initial Capability Document (IS-ICD), which was approved 9 March 2018 (Army Requirements Oversight Council [AROC] Memorandum 18-13). TCM Cyber is preparing Core Functionality and Understanding Cyberspace Requirement Definition Package (RDP) in support of Cyber SU. The RDP and subsequent Capability Drops (CDs) are to be approved by the U.S. Army Cyber Center of Excellence in collaboration with U.S. Army Forces Command. Projected RDP approval is 29 January 2019 at the AROC Requirements Board.

Cyber SU will field increasing capability to meet the RDPs and CDs over the program's life cycle. Development of the capability will be depend on several factors, including (but not limited to) availability of commercial and/or government-developed products and how easily the product(s) can be integrated. To that end, the program office intends to evaluate and leverage GOTS/COTS products to the greatest extent and potentially leverage cyber solutions developed by related programs and science and technology efforts (e.g., Defensive Cyberspace Operations (DCO) and Tactical DCO Infrastructure) to satisfy the requirements detailed in the Cyber SU RDPs/ CDs. The results of this analysis will inform the final decision on the acquisition strategy, which could include agile developer/operator (DEVOPS) and Section 804. Coordination and integration with complimentary programs and systems-the sources of cyber data feeds-will be an integral part of the program to ensure the data is made available to be consumed by the Cyber SU solution.

Program Executive Office, Command, Control and Communications-Tactical, the Milestone Decision Authority (MDA), approved the Materiel Development Decision on 20 June 2018. The entry point into the acquisition life cycle and projected timeline to a milestone decision will be proposed to the MDA upon receipt and review of the validated RDPs.

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E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering/ Management	TBD	TBD : TBD	-	-		-		2.473		-		2.473	0.000	2.473	-
		Subtotal	-	-		-		2.473		-		2.473	0.000	2.473	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cyber SU Development/ Prototyping	TBD	TBD : TBD	-	-		-		15.148		-		15.148	0.000	15.148	-
		Subtotal	-	-		-		15.148		-		15.148	0.000	15.148	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Training Development	TBD	TBD : TBD	-	-		-		0.118		-		0.118	0.000	0.118	-
		Subtotal	-	-		-		0.118		-		0.118	0.000	0.118	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test	TBD	TBD : TBD	-	-		-		0.883		-		0.883	0.000	0.883	-
ATEC Support	TBD	US Army Test and Evaluation Command : Aberdeen Proving Ground, MD	-	-		-		0.731		-		0.731	0.000	0.731	-
Accreditation/Certification	TBD	TBD : TBD	-	-		-		0.830		-		0.830	0.000	0.830	-
		Subtotal	-	-		-		2.444		-		2.444	0.000	2.444	N/A

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	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		20.183		-		20.183	0.000	20.183	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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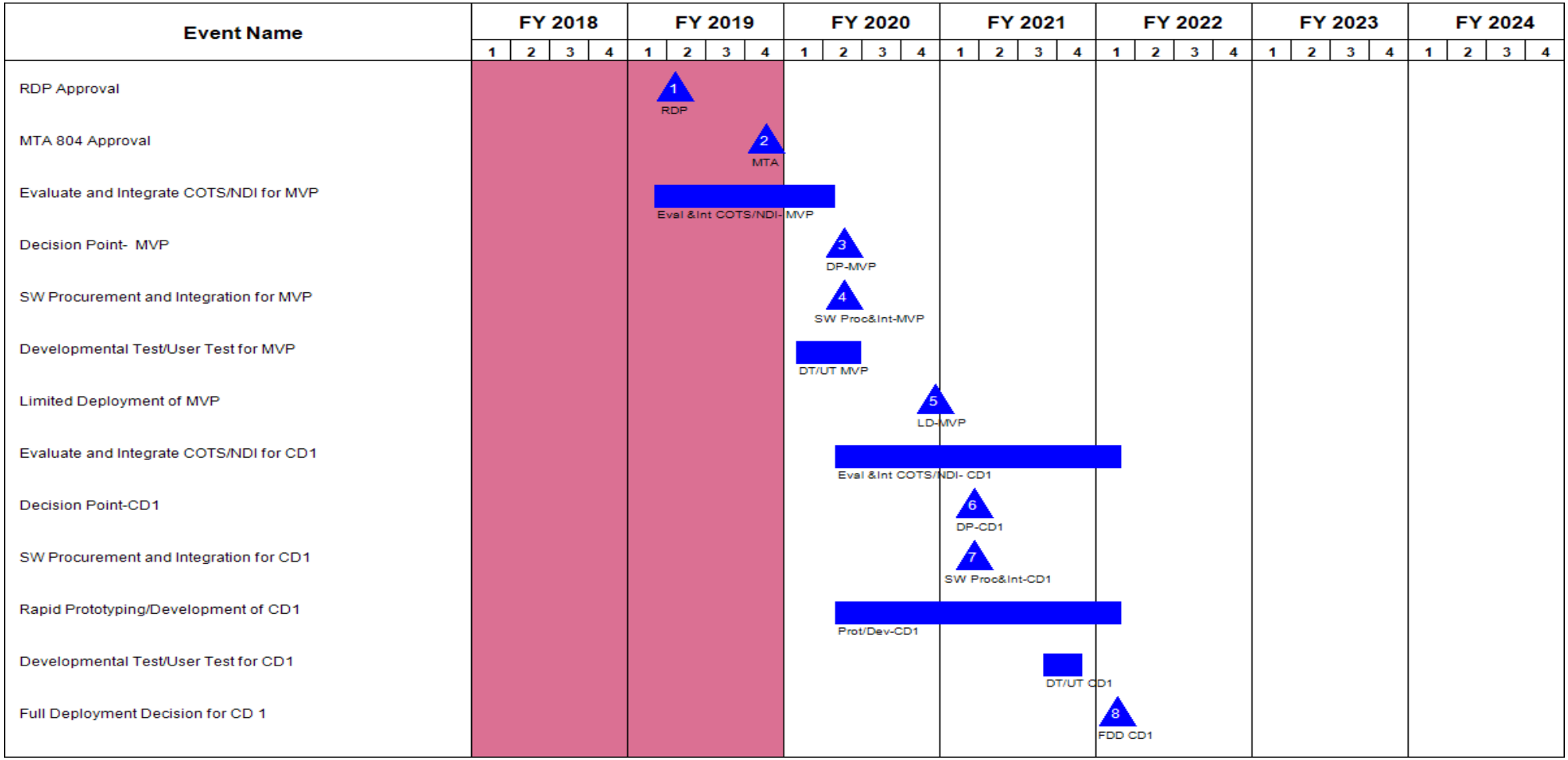

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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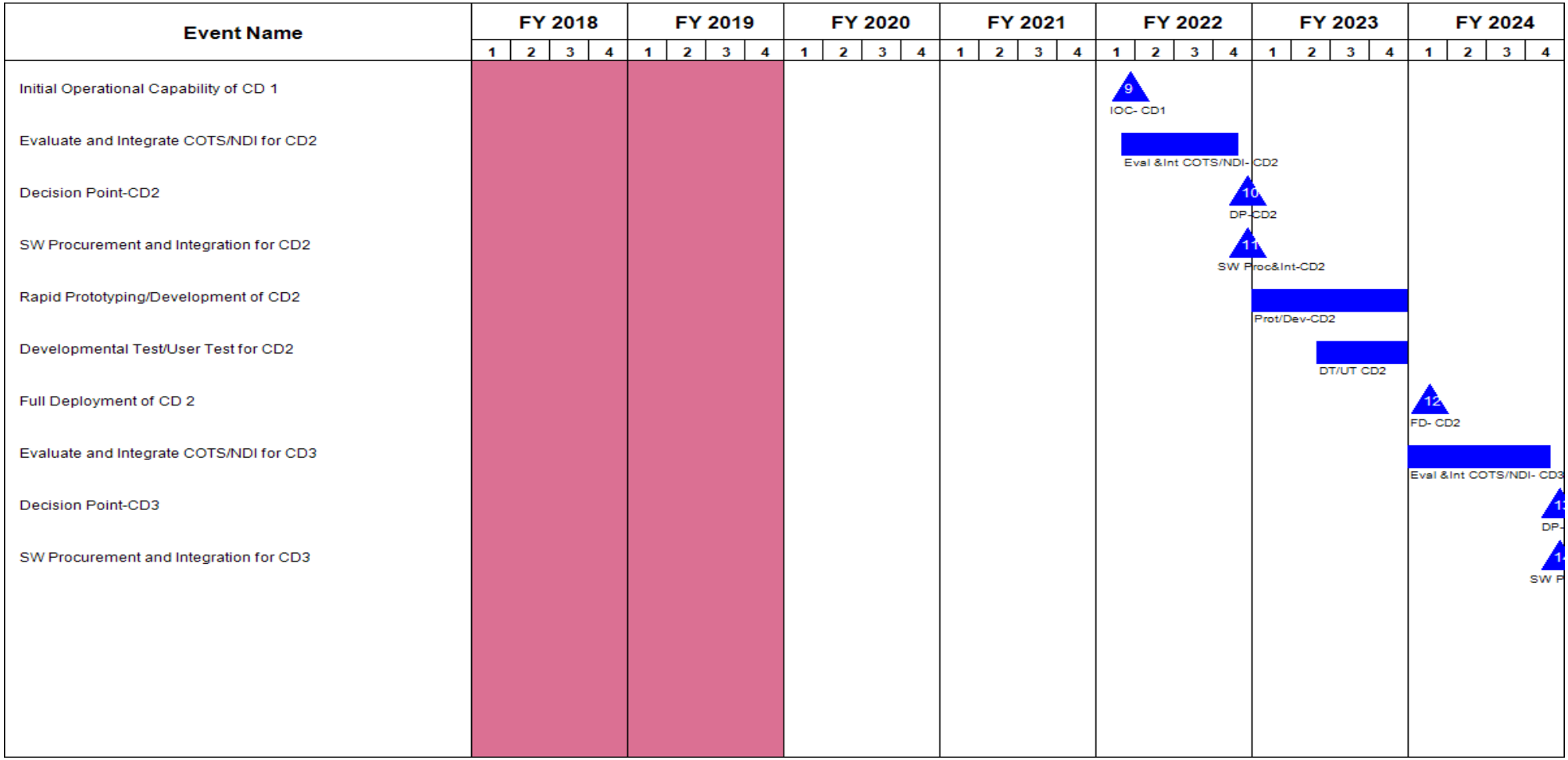

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
RDP Approval	2	2019	2	2019
MTA 804 Approval	4	2019	4	2019
Evaluate and Integrate COTS/NDI for MVP	1	2019	2	2020
Decision Point- MVP	2	2020	2	2020
SW Procurement and Integration for MVP	2	2020	2	2020
Developmental Test/User Test for MVP	1	2020	2	2020
Limited Deployment of MVP	4	2020	4	2020
Evaluate and Integrate COTS/NDI for CD1	2	2020	1	2022
Decision Point-CD1	1	2021	1	2021
SW Procurement and Integration for CD1	1	2021	1	2021
Rapid Prototyping/Development of CD1	2	2020	1	2022
Developmental Test/User Test for CD1	3	2021	4	2021
Full Deployment Decision for CD 1	1	2022	1	2022
Initial Operational Capability of CD 1	1	2022	1	2022
Evaluate and Integrate COTS/NDI for CD2	1	2022	4	2022
Decision Point-CD2	4	2022	4	2022
SW Procurement and Integration for CD2	4	2022	4	2022
Rapid Prototyping/Development of CD2	1	2023	4	2023
Developmental Test/User Test for CD2	2	2023	4	2023
Full Deployment of CD 2	1	2024	1	2024
Evaluate and Integrate COTS/NDI for CD3	1	2024	4	2024
Decision Point-CD3	4	2024	4	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
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	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
SW Procurement and Integration for CD3	4	2024	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040 / 5					R-1 Program Element (Number/Name) PE 0605041A / *Defensive CYBER Tool Development*				Project (Number/Name) EV5 / *Defensive CYBER Operations*			
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
EV5: *Defensive CYBER Operations*	-	41.441	33.796	42.079	-	42.079	29.738	92.873	94.974	90.000	0.000	424.901
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Defensive Cyber Operations - Tactical DCO Infrastructure (TDI)- (PEO C3T)
Defensive Cyber Operations - Cyberspace Analytics - (PEO EIS)
Defensive Cyber Operations - Mission Planning - (PEO EIS)
Defensive Cyber Operations - Tools Suite - (PEO EIS)
Defensive Cyber Operations - Garrison DCO Platform - (PEO EIS)
Defensive Cyber Operations - Deployable DCO System - (PEO EIS)
Defensive Cyber Operations - User Activity Monitoring - (PEO EIS)
Defensive Cyber Operations - Forensics and Malware - (PEO EIS)
Defensive Cyber Operations - Advanced Sensors - (PEO EIS)
Defensive Cyber Operations - Threat Emulation - (PEO EIS)
Defensive Cyber Operations - Counter Infiltration - (PEO EIS)
Defensive Cyber Operations - Forge - (PEO EIS)
Defensive Cyber Operations - Rapid Cyber Prototyping - (ARCYBER)

A. Mission Description and Budget Item Justification

Defensive Cyber Operations (DCO) falls within Line of Effort (LOE) 1 of the Network Modernization Strategy framework, which incorporates cyber capabilities that support the employment of the network as a weapon system.

FY 2020 RDTE DCO efforts consists of the following critical capabilities:

-Tactical DCO Infrastructure (TDI): System (automated on boot infrastructure to deploy DCO Tools on the Tactical Server Infrastructure (TSI)) which resides within the Command Post, at Brigade through Corps, for both organic Cyber Network Defenders as well as remote access by CPT to support defense of the tactical network (PEO C3T)
-Cyberspace Analytics (CA): Identification of threat trends, behavior patterns, and Techniques Tactics and Procedures (TTPs) relative to associated portions of the information environment. The cyberspace analytics capability offers an integrated platform that can be leveraged across all security enclaves (NIPRNET, SIPRNET, and JWICS) to enhance both DCO and Department of Defense Information Network (DODIN) operations (PEO EIS)
-Mission Planning (MP): An application-based, scalable warfighting capability for Army DCO mission command and planning at the global, regional, and local levels. DCO MP enables integration, coordination, and synchronization of supported and supporting cyberspace defenders (PEO EIS)

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-Tools Suite: Flexible and dynamic suite of warfighting capabilities that enable Cyber Mission Forces and other cyberspace defenders to perform functional categories consisting of site survey; risk assessment; observation; intel support; counter-mobility; developer/operator (DEVOPS), event correlation, and command and control (PEO EIS)
-Garrison DCO Platform (GDP): Prepositioned, dedicated compute and storage resources residing at high/extremely high risk installations. Provides cyberspace defenders a remote maneuver capability in order to augment and/or support cyberspace defenders existing at designated bases, posts, camps, or stations by preserving an organization's ability to utilize mission critical data, networks, net-centric capabilities, and other designated systems (PEO EIS)
-Deployable DCO System (DDS): A deployable kit, with dedicated compute and storage for austere environments that do not have prepositioned infrastructure or locations for which prepositioned DCO resources do not provide adequate capacity. The DDS allows global cyberspace defenders (e.g. CPTs) the ability to jump into a network, physically, onsite and gain a position of advantage to augmenting organic local and/or regional cyberspace defenders (PEO EIS)
-User Activity Monitoring (UAM): The primary capability within the Army's overall insider threat detection (InT) program. UAM is a software-based, scalable solution that proactively identifies and mitigates internal risks associated with the theft and misuse of critical, mission essential data. UAM utilizes full-spectrum solutions to assess, deter, deny, defend, defeat, and evolve against the insider threat hub (PEO EIS)
-Forensics and Malware Analysis (F&MA): Warfighting capability adheres to the global standard in digital investigation technology for global or regional cyberspace defenders who need to conduct efficient, forensically-sound, data collection and examination either remotely or locally using a repeatable and defensible process. Forensics gives cyberspace defenders the ability to triage by quickly viewing and searching potential evidence in order to determine whether further examination is warranted (PEO EIS)
-Advanced Sensors: Real-time discovery of specific advanced or sophisticated cyber threats and vulnerabilities on a critical system or segment of the network. Advanced sensors provides an automated monitoring and incident handling capability lower in the network architecture (access layer) to conduct over-watch for high-risk units or systems that normally operate out of view ("last mile") from traditional security or DCO measures (PEO EIS)
-Threat Emulation: Software and hardware based suite of tools used by a Cyber OPFOR to gain access to evaluated networks and systems using multi-vectors of unknown ("blackbox"), partially known ("graybox"), or known ("whitebox") access methods. Enables the implementation of real world threat tactics, techniques, and procedures against risk areas in order to reveal extremely high-risk security exposures and demonstrate the operational impact of a potential attack (PEO EIS)
-Counter Infiltration: Software/hardware array of components that retrogrades mission critical assets from virtual areas under a cyber threat actor's control using stealth, deception, surprise, or clandestine movements. The capability allows commanders and leaders to trade space for time by slowing down the advanced persistent threat's without becoming decisively engaged (PEO EIS)
-Forge: Provides integration and assessment capabilities during the development and integration phases of operations. DCO program will leverage non-FAR based Other Transaction Authorities (OTA) to solicit prototype/new technologies for consideration of procurement decisions.
-Rapid Cyber Prototyping: Rapidly develops cyber capabilities identified by the Cyber Mission Forces (CMF) in order to counter advanced, persistent, and sophisticated cyber threats (ARCYBER)

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Defensive Cyber Operations (DCO) - Tactical DCO Infrastructure (TDI) - (PEO C3T)	9.527	6.343	3.282
Description: TDI is a system (automated on boot infrastructure to deploy DCO Tools on the Tactical Server Infrastructure (TSI)) which resides within the Command Post, at Brigade through Corps, for both organic Cyber Network Defenders as well as remote access by CPT to support defense of the tactical network. (PEO C3T)			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: The FY19 funding will support completion of development engineering, integration and testing of the Minimum Viable Product (MVP) capability release of TDI. ***FY 2020 Plans:*** FY20 funding will support the development engineering, integration and testing of Capability Drop 1 (CD1). CD1 will upgrade the DCO tools integrated on the TSI, expand the sensor architecture to more command post applications, thus increasing the tactical commander?s defensive cyber posture. This effort?s funding will be executed by Program Executive Office for Command, Control and Communications-Tactical. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 increase due to continuous need of integrating new DCO tools within the TSI and expanding the Cyber sensor architecture to more command post applications.			
Title: Defensive Cyber Operations (DCO) - Cyberspace Analytics - (PEO EIS)	23.234	9.129	10.400
Description: The cyberspace analytics capability offers interfaces and visualizations accessible by cyberspace defenders at all levels to facilitate reconnaissance activities meant to discover the presence of advanced or sophisticated cyberspace threats and vulnerabilities. The cyberspace analytics capability offers an integrated platform that can be leveraged across all security enclaves (NIPRNET, SIPRNET, and JWICS) in order to ingest, process, store, share, and visualize multiple petabyte, distributed data sets. ***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, Data Discovery Model, Distributed Query, Whitelist/Blacklist, Single Sign-On Analytic, Greyspace Analysis Analytic, Data Correlation Analytic and Reduced Alert Overhead Analytic. ***FY 2020 Plans:*** Continue improvements to the cyberspace analytic/big data platform solution by adding additional data parsers that support behavioral, prescriptive, and predictive analytics. Improvements will also include provisioning of graphical techniques to see patterns in data that might not otherwise be obvious. The Army will additionally increase the use of embedded capabilities consisting of tools that are integrated with other applications, operating as a component of the application rather than a separate platform. Critical to success is the maturation of DEVOPS and DEVOPS tools to support rapid cyberspace analytical development.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Moreover, the Army will continue to ensure the confidentiality and integrity of data residing on the platform by improving or adding identify and access management, as well as cross domain data transfer solutions. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase due to continuous improvements to the cyberspace analytic/big data platform solution by adding additional data parsers that support behavioral, prescriptive, and predictive analytics.			
Title: Defensive Cyber Operations (DCO) - Mission Planning - (PEO EIS) ***Description:*** DCO Mission Planning (DCOMP) integrates network security requirements, intelligence, and vulnerability analyses, with a commander?s operation order (e.g. mission statement, commander?s intent, planning guidance, initial commander critical information requirements/essential elements of friendly information, and assumptions), and other military decision-making process outputs, and actions to identify key terrain in cyberspace and mission critical assets; determine probable attack vectors; and produce a set of relevant internal defense measures, triggers, and decision points. The result is the automated production of the appropriate operations order (OPORD) appendix, which is then war-gamed in a simulation engine for evaluation and improvement. DCOMP utilizes the final OPORD to rapidly provision necessary platforms so cyberspace defenders can execute mission in near real-time. ***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. ***FY 2020 Plans:*** Continued improvements to DCOMP will include the ability to map a network with a commander's military or business operation in order to automate the identification of mission relevant terrain in cyberspace. This will support the insertion of a battle tracking capability that monitors mission execution and provides a status on mission performance and effectiveness. Additionally, the Army will seek to integrate a cross domain solution and develop a wargaming module (to include Persistent Cyber Training Range integration). Finally, development efforts will focus on the creation of a controller module that can take the output of the military decision making process and automatically array corresponding infrastructure, platforms, and tools against the mission in a way that readies the capabilities before the virtual or on-site arrival of cyberspace defenders. The Army will ensure the capability maintains access to applicable cyber symbology and geospatial information Infrastructure Controller. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	6.613	10.322	9.100

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Provides limited continuous improvements to DCOMP including the ability to map a network with a commander's military or business operation in order to automate the identification of mission relevant terrain in cyberspace.			
Title: Defensive Cyber Operations (DCO) - Tools Suite - (PEO EIS) ***Description:*** The Army employs its tools within a prepositioned or deployable environment and organizes them by function. DCO tools are functionality aligned to identified performance characteristics. Functional categories consist of site survey; risk assessment; observation; intel support; counter-mobility; DEVOPS, event correlation, and command and control. Tools are encapsulated into purpose-built platforms: Publicly available security distributions (managed by open source teams outside of the Army?s direct control), virtual machines (VM) containing licensed tools (containerized with an operating system (OS) and vendor-licensed software installed), and Orchestrated VMs (VMs exist with just enough OS to be able to receive instructions from a host cloud computing OS). Facilitates evaluations and assessments in a closed, controlled repeatable environment on virtualized infrastructure of common services, toolsets, and/or platforms for simplifying and standardizing designs and processes, as well as codifying functions and services into an ontology. ***FY 2019 Plans:*** Support the 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 ***FY 2020 Plans:*** Operational development environment that provides Soldiers access to Open Source software code as well as hardware in a toolbox configuration allowing them to build the DCO capabilities in response to real-time threats. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No significant changes.	0.689	1.548	1.600
Title: Defensive Cyber Operations (DCO) - Garrison DCO Platform - (PEO EIS) ***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. ***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. ***FY 2020 Plans:***	0.689	0.288	0.950

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue to improve the ability to tap, filter, process and manipulate traffic all in a cloud environment. Continue to evaluate less expensive options for packet processing, deep packet inspection, and load balancing. Prototyping ?extreme architectures? that string together multiple microprocessors and establish software-based architectures to harness the processing power inherent to the instantiation of numerous platforms. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY19 funding support the enhancement of remote management capability to include passive network mapping, remote management of advanced sensors, and interface with Reserve and National Guard capabilities. FY20 will be for new emerging prototyping technology only.			
Title: Defensive Cyber Operations (DCO) - Deployable DCO System - (PEO EIS) ***Description:*** A deployable (fly away) kit, with dedicated compute and storage for austere environments that do have prepositioned infrastructure or locations for which prepositioned DCO resources do not provide adequate capacity. The DDS allows global cyberspace defenders (e.g. CPTs) the ability to jump into a network, physically, onsite and gain a position of advantage to augmenting organic local and/or regional cyberspace defenders. ***FY 2019 Plans:*** Provide engineering, prototyping, and test and evaluation support for Deployable DCO System. ***FY 2020 Plans:*** Improve on data ingest speeds, data staging options, and develop capabilities for remote operations (to include executive communications for Army National Guard and Reserved). Continue to improve the ability to tap, filter, process, and manipulate traffic all in a cloud environment. Continue to evaluate less expensive options for packet processing, deep packet inspection, and load balancing. Prototype smaller kits for initial and sustained configurations and determine viability of lite-kit for quick reaction, very short mission durations. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** AROC approved on 16 Jan 18. FY20 procures engineering, prototyping, and test and evaluation support for DDS.	0.689	0.288	0.950
Title: Defensive Cyber Operations (DCO) - User Activity Monitoring - (PEO EIS) ***Description:*** The primary capability within the Army's overall insider threat detection (InT) program. UAM is a software-based, scalable solution that proactively identifies and mitigates internal risks associated with the theft and misuse of critical, mission essential data. UAM utilizes full-spectrum solutions to assess, deter, deny, defend, defeat, and evolve against the insider threat hub. ***FY 2019 Plans:***	-	0.297	2.764

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Provides data audit and trigger capabilities for all users on both the SIPRNET, JWICS, and special access program environments, as well as privilege users on the NIPRNET. Integrates behavioral analysis and associated data sources with the UAM capability. ***FY 2020 Plans:*** Implementation of UAM for all Soldiers, civilian, and contractors with access to Joint Worldwide Intelligence Communication System (JWICS) and SIPRNet. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Implementation of UAM for all Soldiers, civilian, and contractors with access to Joint Worldwide Intelligence Communication System (JWICS) and SIPRNet.			
Title: Defensive Cyber Operations (DCO) - Forensics and Malware Analysis - (PEO EIS) ***Description:*** Warfighting capability adheres to the global standard in digital investigation technology for global or regional cyberspace defenders who need to conduct efficient, forensically-sound, data collection and examination either remotely or locally using a repeatable and defensible process. Forensics gives cyberspace defenders the ability to triage by quickly viewing and searching potential evidence in order to determine whether further examination is warranted ***FY 2019 Plans:*** Development efforts will provide initial capabilities under a program to the ARCYBER Forensics and Malware Cell, the Army's five (5) Regional Cyber Centers, the Cyber Protection Brigade Advanced Threat Analysis and Mitigation Cell, and potentially Army National Guard and Army Reserve units. Initial capabilities delivered will be those that enable live-box forensics either remotely or locally. Additionally, the solution will provide analysts a semi-automated capability to analyze file systems, timelines, network traffic, web histories, recycle bins, memory, disks, logs, registries, and other artifacts. The solution will additionally consist of a software-based application to analyze malicious code in a sandbox-like, virtual environment in order to conduct real-time, automated and dynamic malware decomposition and behavior analysis. ***FY 2020 Plans:*** Provides cyberspace defenders ability to rapidly triage an incident, assists with determining subsequent actions required to collect, process, search and analyze evidence from multiple media/devices. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY20 provides key enhancements which include improved reporting, integration with existing cybersecurity solutions, increased OS and file system support, a more intuitive user interface, and advanced case management.	-	0.288	0.530
Title: Defensive Cyber Operations (DCO) - Advanced Sensors - (PEO EIS) ***Description:*** Real-time discovery of specific advanced or sophisticated cyber threats and vulnerabilities on a critical system or segment of the network. Advanced sensors provides an automated monitoring and incident handling capability lower in the	-	-	3.250

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
network architecture (access layer) to conduct over-watch for high-risk units or systems that normally operate out of view ("last mile") from traditional security or DCO measures. ***FY 2020 Plans:*** Develop initial capability that is a simple, very small, low-cost solution employed along likely avenues of approach (physical and logical). The initial capability will provide an automated surveillance and counter-mobility solution lower in the network architecture (access layer) to conduct over-watch for high-risk units or systems that normally operate out of view (?last mile?) from traditional, routine security or DCO measures. The primary measure of effectiveness for an advanced cyber sensor is real-time discovery of specific advanced or sophisticated cyber threats and vulnerabilities on a critical system or segment of the network. When a TTP is detected, advanced sensors can execute a myriad of tailored response actions (block, neutralize, deceive, redirect, etc.) on the associated payload. The result is an increased ability to interrupt the adversary at the beginning of the cyber kill chain by employing counter-measures during the reconnaissance and weaponization phases; and neutralizing and/or deceiving the adversary during the delivery, exploitation, and installation phases. To enable this approach, advanced cyber sensors incorporate indications and warnings (I&W) algorithmically to provide identification and reporting of time-sensitive information on developments that could involve a threat to the network. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** New start in FY20.			
Title: Defensive Cyber Operations (DCO) - Threat Emulation - (PEO EIS) ***Description:*** Software and hardware based suite of tools used by a Cyber Opposing Forces to gain access to evaluated networks and systems using multi-vectors of unknown ("blackbox"), partially known ("graybox"), or known ("whitebox") access methods. Enables the implementation of real world threat tactics, techniques, and procedures against risk areas in order to reveal extremely high-risk security exposures and demonstrate the operational impact of a potential attack. ***FY 2020 Plans:*** Develop initial capability for designated cyberspace defenders to conduct threat emulation activities IAW applicable concepts of operations and regulations. Initial capabilities will consists of a solution used to gain access to evaluated networks and systems through multi-vectors of unknown, partially known, or known exploits. Threat Emulation will enable the implementation of real world threat tactics, techniques, and procedures against risk areas in order to reveal critical security exposures. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** New start in FY20.	-	-	3.403
Title: Defensive Cyber Operations (DCO) - Counter Infiltration - (PEO EIS)	-	-	2.850

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Software/hardware array of components that retrogrades mission critical assets from virtual areas under a cyber threat actor's control using stealth, deception, surprise, or clandestine movements. The capability allows commanders and leaders to trade space for time by slowing down the advanced persistent threat's without becoming decisively engaged. ***FY 2020 Plans:*** Develop initial capability consisting of an array of components that retrograde mission critical assets from virtual areas under a cyberspace threat actor?s control using stealth, deception, surprise, or clandestine movements. The capability will change the identity of assets between relatively small time periods based on mathematical algorithms. Mission critical assets within the same virtual area of operations will share certain, common information, which results in an asset not only knowing it's next identity and location, but it is additionally aware of the next identity and location of all other mission critical systems. As time progresses, systems within the same Area of Operations retrograde in unison. Characteristics of a system that can change consist of Internet Protocol address, media access control address, ports, protocol, services, computer name, etc. The capability will allow commanders and leaders to trade space for time by slowing down the advanced persistent threat?s without becoming decisively engaged. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** New start in FY20.			
Title: Defensive Cyber Operations (DCO) - Forge (Integration) - (PEO EIS) ***Description:*** The Forge is a physical location that provides integration and assessment capabilities during the development and integration phases of operations. Full Operational Capability (FOC) by FY20. ***FY 2019 Plans:*** At the Forge, the DCO program will leverage non-FAR based Other Transaction Authorities (OTA) to solicit prototype/new technologies for consideration of procurement decisions. OTAs will provide access to industry (large, small, and by definition non-traditional defense contractors), academia, as well as Government laboraties. The Forge is also the primary location for the administration of a rapid prototyping process referred to as the Cyberspace Real-Time Acquisition Prototype Innovation Development (C-RAPID). ***FY 2020 Plans:*** Continues to provide DCO Suite of Complimentary Systems (DSCS) integration and testing at the Forge. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The Forge will be at FOC in FY20. FY20 decrease due to funding reprioritization.	-	5.293	2.000
Title: Defensive Cyber Operations (DCO) - Rapid Cyber Prototyping - (ARCYBER)	-	-	1.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** EV5 / *Defensive CYBER Operations*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: Rapidly develops cyber capabilities that cannot be acquired through traditional acquisition process in order to counter advanced, persistent, and sophisticated cyber threats. ***FY 2020 Plans:*** Supports rapid prototyping, developmental assessment and operational fielding of capabilities and responses to Cyber Mission Forces Cyber Needs Form. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** New start in FY20.			
Accomplishments/Planned Programs Subtotals	41.441	33.796	42.079

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• B63103: *DEFENSIVE CYBER TOOLS*	53.436	51.343	61.962	-	61.962	69.655	95.504	104.568	114.000	Continuing	Continuing
• N/A: *OMA Defensive Cyber Operations (MDEP MU2Z SAG 432612)*	0.640	3.000	5.000	-	5.000	5.000	5.000	-	-	Continuing	Continuing

Remarks

OPA PE B63103 for DCO procurement, fielding and training.
OMA SAG 432612 for DCO License Renewals and non-traditional sustainment.
OMA SAG 435106 for Civilian Pay was established by the Department starting in FY19 due to Reimbursable to Direct conversion for DCO.

D. Acquisition Strategy

The Defensive Cyber Operations (DCO) will support multiple programs. The Army conducted Materiel Development Decisions (MDD) in FY18 based upon the DCO Information System Initial Capabilities Document (IS ICD). DCO will develop and integrate the DCO Suite of Complimentary Systems (DSCS) using an incremental evolutionary acquisition approach that employs iterative development and acquisition reform principals, complying with the 1996 Clinger-Cohen Act. The approach leverages prototyping using the Operational Needs Statement (ONS) high-level objectives as a bridging strategy to establish the acquisition programs. The DSCS was initiated via four (4) ONSs, which have transitioned into Program of Records (PORs).

System designs focus on open architecture and open source capabilities. Department will utilize Evolutionary Acquisition (Delivery, Assess, Deploy, Learn and Iterate). Implementation of a modular design to maximize innovation through continuous releases. Modules will be refined by industry as a component through adoption of

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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prototypes. Each program will have a prime integrator (single contractor) that integrates the new modules. The Government will assess and create prototypes employing a combination of Government entities and commercial vendors via Other Transaction Authority contract vehicle.

The Tactical DCO Infrastructure (TDI) program's MDD was conducted in 2QFY18. Based on the validated DCO IS ICD and the TDI Requirements Definition Package (RDP), the Milestone Decision Authority (MDA) signed the Acquisition Decision Memorandum (ADM) delegating TDI as an ACAT III program. TDI will leverage the Simplified Acquisition Plan (SAMP) approach and will use acquisition tailoring in preparing for MSB, scheduled for 3QFY19. To support the Department's evolutionary acquisition approach, the TDI program office will develop the software infrastructure and deployment scripts that provide a technological solution that is converged with the Tactical Server Infrastructure in a series of incremental builds to deliver capabilities that align with DCO priorities. Execution of the TDI program will be a combination of government entities and commercial vendors.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Defensive Cyber Operations - Tactical DCO Infrastructure (TDI) (PEO C3T)	C/CPFF	PEO C3T : Aberdeen Proving Ground (APG), MD	4.188	3.509		2.282		1.180		-		1.180	Continuing	Continuing	Continuing
Defensive Cyber Operations (DCO) - Cyberspace Analytics (PEO EIS)	C/FFP	PEO EIS : Ft Belvoir, VA	0.228	0.324		0.299		0.700		-		0.700	Continuing	Continuing	Continuing
Defensive Cyber Operations - Tools Suite (PEO EIS)	C/FFP	PEO EIS : Ft Belvoir, VA	-	0.189		0.288		0.100		-		0.100	Continuing	Continuing	Continuing
Defensive Cyber Operatons - Garrison DCO Platform (PEO EIS)	C/FFP	PEO EIS : Ft Belvoir, VA	0.724	0.189		0.288		0.100		-		0.100	Continuing	Continuing	Continuing
Defensive Cyber Operatios - Mission Planning (PEO EIS)	C/FFP	PEO EIS : Ft Belvoir, VA	0.219	0.323		0.298		0.200		-		0.200	Continuing	Continuing	Continuing
Defensive Cyber Operations - Deployable DCO System (PEO EIS)	C/FFP	PEO EIS : Ft Belvoir, VA	-	0.189		0.288		0.100		-		0.100	Continuing	Continuing	Continuing
Defensive Cyber Operations - Forensics and Malware (PEO EIS)	C/FFP	PEO EIS : Ft Belvoir, VA	-	-		0.288		-		-		-	0.000	0.288	-
Defensive Cyber Operations - User Activity Monitoring (PEO EIS)	C/FFP	PEO EIS : Ft Belvoir, VA	-	-		0.297		-		-		-	0.000	0.297	-
Defensive Cyber Operations - Forge (PEO EIS)	C/FFP	PEO EIS : Ft Belvoir, VA	-	-		5.293		2.000		-		2.000	0.000	7.293	-
		Subtotal	5.359	4.723		9.621		4.380		-		4.380	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** EV5 / *Defensive CYBER Operations*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Defensive Cyber Operations - Tactical DCO Infrastructure (TDI) (PEO C3T)	C/CPFF	SEC and I2WD : Aberdeen Proving Ground (APG), MD	1.631	5.190		3.453		1.787		-		1.787	Continuing	Continuing	Continuing
Defensive Cyber Operations - Cyberspace Analytics (PEO EIS)	C/FFP	ACC-RI : IL	3.700	17.987	Jan 2018	8.830	Dec 2018	8.500		-		8.500	Continuing	Continuing	Continuing
Defensive Cyber Operations - Tools Suite (PEO EIS)	C/TBD	ACC-Rock Island (ACC-RI) : IL	-	-		1.260		1.300		-		1.300	Continuing	Continuing	Continuing
Defensive Cyber Operations - Garrison DCO Platform (PEO EIS)	C/FFP	ACC-RI : IL	2.060	-		-		0.700		-		0.700	Continuing	Continuing	Continuing
Defensive Cyber Operations - Garrison DCO Platforms (PEO EIS)	C/Various	ACC-PI : NJ	9.690	-		-		-		-		-	Continuing	Continuing	Continuing
Defensive Cyber Operations - Deployable DCO System (PEO EIS)	C/Various	ACC-RI : IL	-	-		-		0.700		-		0.700	Continuing	Continuing	Continuing
Defensive Cyber Operations - Mission Planning (PEO EIS)	C/CPFF	ACC-RI : IL	-	-		10.024	Nov 2018	8.900		-		8.900	Continuing	Continuing	Continuing
Defensive Cyber Operations - User Activity Monitoring (PEO EIS)	C/T&M	ACC-RI : IL	-	-		-		2.764		-		2.764	Continuing	Continuing	Continuing
Defensive Cyber Operations - Forensics and Malware (PEO EIS)	C/TBD	ACC-RI : IL	-	-		-		0.530		-		0.530	Continuing	Continuing	Continuing
Defensive Cyber Operations - Advanced Sensors (PEO EIS)	C/TBD	ACC-RI : IL	-	-		-		3.250		-		3.250	Continuing	Continuing	Continuing
Defensive Cyber Operations - Threat Emulation (PEO EIS)	C/TBD	ACC-RI : IL	-	-		-		3.403		-		3.403	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605041A / *Defensive CYBER Tool Development*	Project (Number/Name) EV5 / *Defensive CYBER Operations*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Defensive Cyber Operations - Counter Infiltration (PEO EIS)	C/TBD	ACC-RI : IL	-	-		-		2.850		-		2.850	Continuing	Continuing	Continuing
Defensive Cyber Operations - Rapid Cyber Prototyping (ARCYBER)	C/TBD	ACC-RI : IL	-	-		-		1.000		-		1.000	0.000	1.000	-
Defensive Cyber Operations - Mission Planning (PEO EIS)	MIPR	USAF, AFMC AIR FORCE RESEARCH LAB : NY	10.095	4.425	Apr 2018	-		-		-		-	0.000	14.520	-
		Subtotal	27.176	27.602		23.567		35.684		-		35.684	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Defensive Cyber Operations - Tactical DCO Infrastructure (TDI) (PEO C3T)	C/TBD	Aberdeen Proving Ground : MD	-	0.828		0.608		0.315		-		0.315	Continuing	Continuing	Continuing
Defensive Cyber Operations - Cyberspace Analytics (PEO EIS)	MIPR	ATEC : MD	-	4.923		-		1.200		-		1.200	0.000	6.123	-
Defensive Cyber Operations - Tools Suite (PEO EIS)	MIPR	ATEC : MD	-	0.500		-		0.200		-		0.200	0.000	0.700	-
Defensive Cyber Operations - Garrison DCO Platform (PEO EIS)	MIPR	ATEC : MD	-	0.500		-		0.150		-		0.150	0.000	0.650	-
Defensive Cyber Operations - Deployable DCO System (PEO EIS)	MIPR	ATEC : MD	-	0.500		-		0.150		-		0.150	0.000	0.650	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Defensive Cyber Operations - Mission Planning (PEO EIS)	MIPR	ATEC : MD	-	1.865		-		-		-		-	0.000	1.865	-
		Subtotal	-	9.116		0.608		2.015		-		2.015	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	32.535	41.441		33.796		42.079		-		42.079	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** EV5 / *Defensive CYBER Operations*

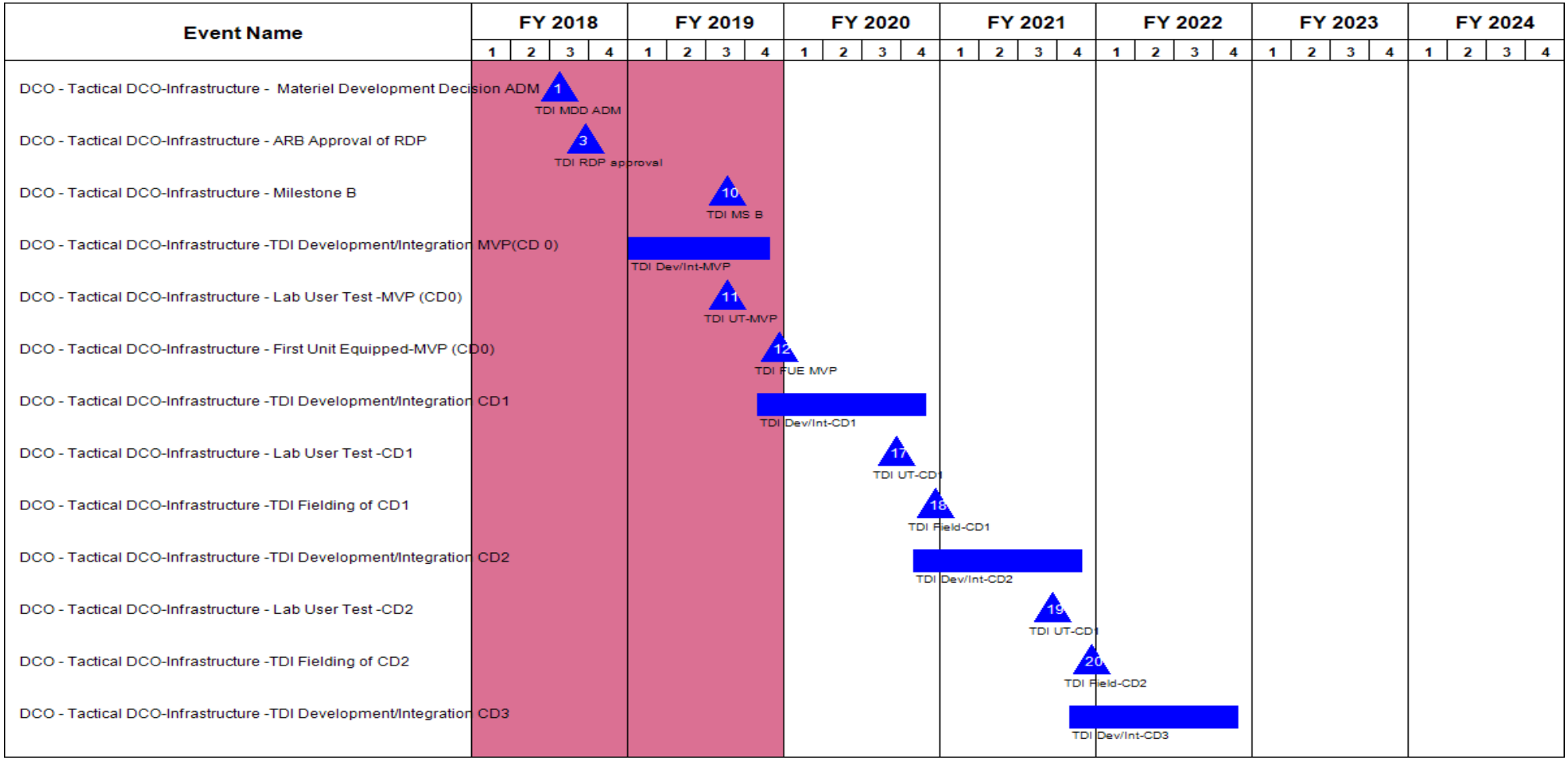

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** EV5 / *Defensive CYBER Operations*

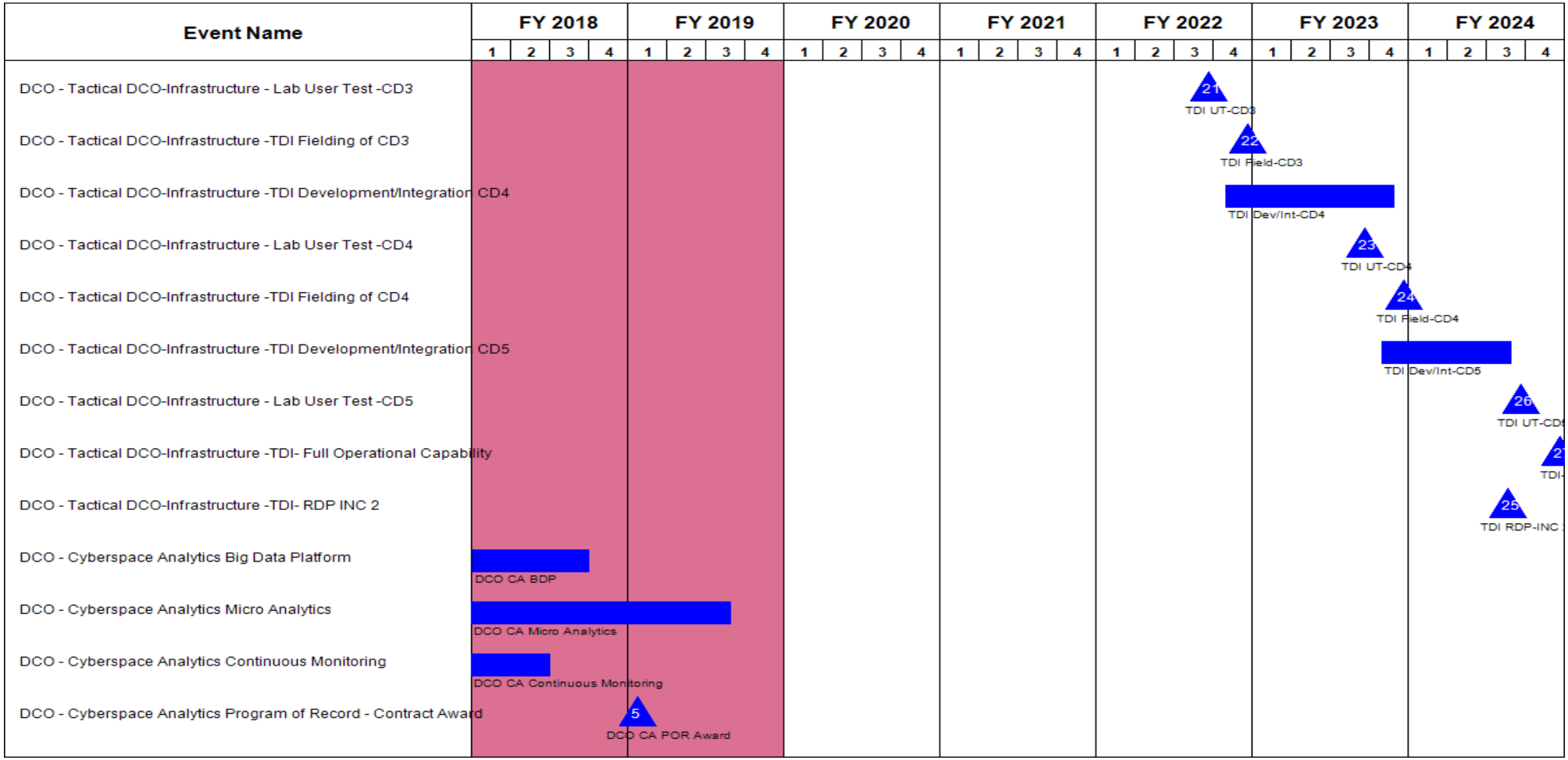

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** EV5 / *Defensive CYBER Operations*

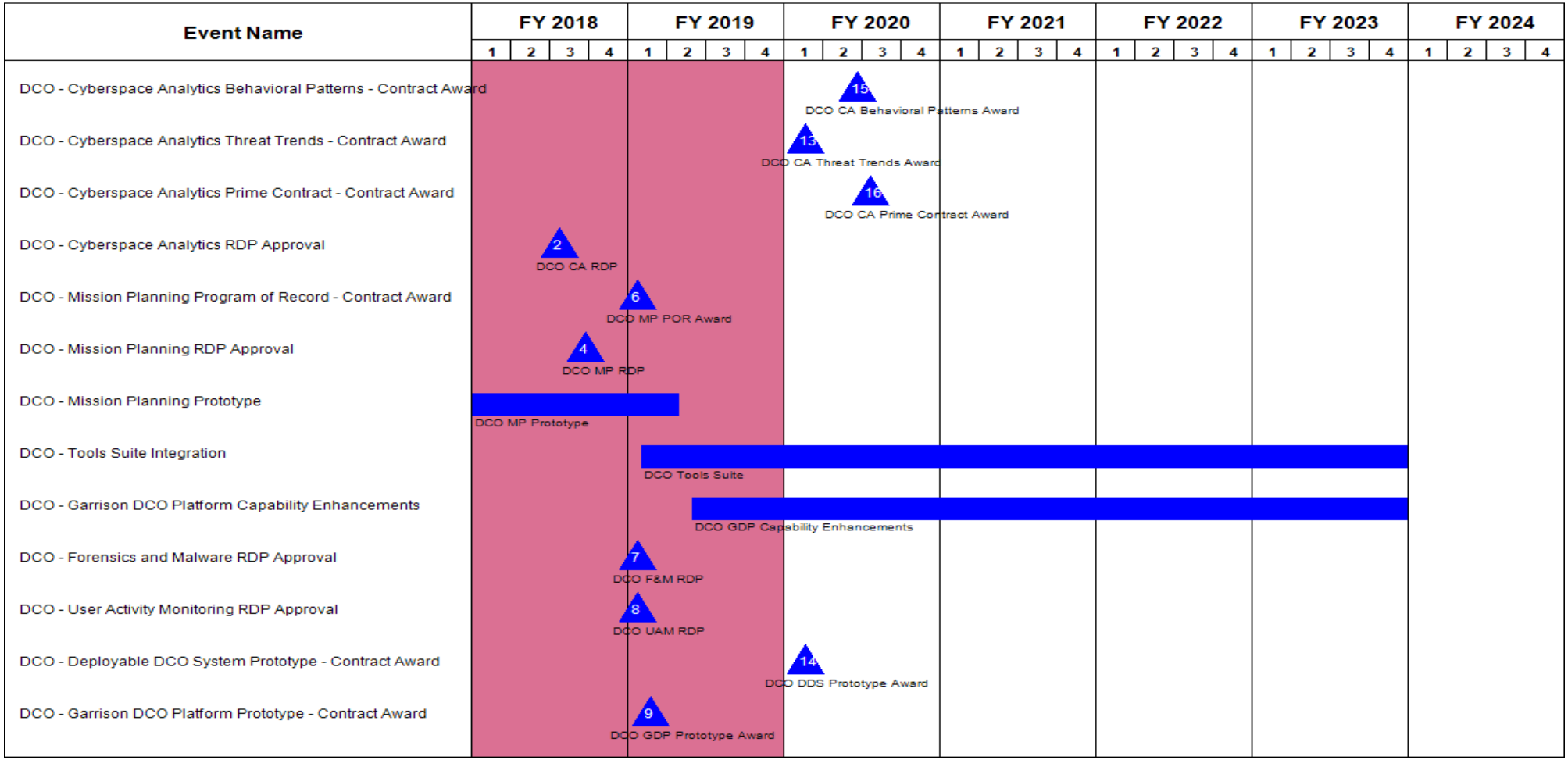

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605041A / *Defensive CYBER Tool Development*	**Project (Number/Name)** EV5 / *Defensive CYBER Operations*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
DCO - Tactical DCO-Infrastructure - Materiel Development Decision ADM	3	2018	3	2018
DCO - Tactical DCO-Infrastructure - ARB Approval of RDP	3	2018	3	2018
DCO - Tactical DCO-Infrastructure - Milestone B	3	2019	3	2019
DCO - Tactical DCO-Infrastructure -TDI Development/Integration MVP(CD 0)	1	2019	4	2019
DCO - Tactical DCO-Infrastructure - Lab User Test -MVP (CD0)	3	2019	3	2019
DCO - Tactical DCO-Infrastructure - First Unit Equipped-MVP (CD0)	4	2019	4	2019
DCO - Tactical DCO-Infrastructure -TDI Development/Integration CD1	4	2019	4	2020
DCO - Tactical DCO-Infrastructure - Lab User Test -CD1	3	2020	3	2020
DCO - Tactical DCO-Infrastructure -TDI Fielding of CD1	4	2020	4	2020
DCO - Tactical DCO-Infrastructure -TDI Development/Integration CD2	4	2020	4	2021
DCO - Tactical DCO-Infrastructure - Lab User Test -CD2	3	2021	3	2021
DCO - Tactical DCO-Infrastructure -TDI Fielding of CD2	4	2021	4	2021
DCO - Tactical DCO-Infrastructure -TDI Development/Integration CD3	4	2021	4	2022
DCO - Tactical DCO-Infrastructure - Lab User Test -CD3	3	2022	3	2022
DCO - Tactical DCO-Infrastructure -TDI Fielding of CD3	4	2022	4	2022
DCO - Tactical DCO-Infrastructure -TDI Development/Integration CD4	4	2022	4	2023
DCO - Tactical DCO-Infrastructure - Lab User Test -CD4	3	2023	3	2023
DCO - Tactical DCO-Infrastructure -TDI Fielding of CD4	4	2023	4	2023
DCO - Tactical DCO-Infrastructure -TDI Development/Integration CD5	4	2023	3	2024
DCO - Tactical DCO-Infrastructure - Lab User Test -CD5	3	2024	3	2024
DCO - Tactical DCO-Infrastructure -TDI- Full Operational Capability	4	2024	4	2024
DCO - Tactical DCO-Infrastructure -TDI- RDP INC 2	3	2024	3	2024

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
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	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
DCO - Cyberspace Analytics Big Data Platform	1	2017	3	2018
DCO - Cyberspace Analytics Micro Analytics	2	2017	3	2019
DCO - Cyberspace Analytics Continuous Monitoring	4	2017	2	2018
DCO - Cyberspace Analytics Program of Record - Contract Award	1	2019	1	2019
DCO - Cyberspace Analytics Behavioral Patterns - Contract Award	2	2020	2	2020
DCO - Cyberspace Analytics Threat Trends - Contract Award	1	2020	1	2020
DCO - Cyberspace Analytics Prime Contract - Contract Award	3	2020	3	2020
DCO - Cyberspace Analytics RDP Approval	3	2018	3	2018
DCO - Mission Planning Program of Record - Contract Award	1	2019	1	2019
DCO - Mission Planning RDP Approval	3	2018	3	2018
DCO - Mission Planning Prototype	1	2018	2	2019
DCO - Tools Suite Integration	1	2019	4	2023
DCO - Garrison DCO Platform Capability Enhancements	2	2019	4	2023
DCO - Forensics and Malware RDP Approval	1	2019	1	2019
DCO - User Activity Monitoring RDP Approval	1	2019	1	2019
DCO - Deployable DCO System Prototype - Contract Award	1	2020	1	2020
DCO - Garrison DCO Platform Prototype - Contract Award	1	2019	1	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army												Date: March 2019
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)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	8.845	3.825	35.654	-	35.654	50.297	47.368	26.235	27.610	0.000	199.834
FA1: *Manpack Radio*	-	1.248	1.957	30.622	-	30.622	39.422	36.335	13.945	15.300	0.000	138.829
FA2: *Rifleman Radio (RR)*	-	7.597	1.868	5.032	-	5.032	10.875	11.033	12.290	12.310	0.000	61.005

A. Mission Description and Budget Item Justification

The Tactical Network Radio Systems (Low-Tier) supports the Army Network Modernization Strategy Line of Effort 1, Unified Network

The HMS radios are a key component of the Integrated Tactical Network which supports a converged Mission Command Network that operates seamlessly worldwide in any environment. These radios will perform under a standards-based network architecture that unifies enterprise and deployed network capabilities. The near-term goal of the HMS radios is to provide 'secure but unclassified' networking capabilities utilizing next generation tactical radios. The cited work is consistent with Strategic Planning Guidance and the Mission Command Network Modernization Implementation Plan.

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 / Beyond Line of Sight 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 and two-channel Leader Radio), Manpack Radio (MP), and Small Form Fit 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 a contested environment.

The Army intends to test and integrate 2-channel communications technologies, utilizing existing Army 2-channel radio variants (HMS Radios), in support of Air to Ground experimentation. Experimentation includes, but not limited to: concept refinement, characterization, data collection, demos, new kit prototyping, and operational assessments.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army					Date: March 2019
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)*		
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	20.076	3.829	10.062	-	10.062
Current President's Budget	8.845	3.825	35.654	-	35.654
Total Adjustments	-11.231	-0.004	25.592	-	25.592
• Congressional General Reductions	-0.009	-0.004			
• Congressional Directed Reductions	-8.739	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-2.040	-			
• SBIR/STTR Transfer	-0.443	-			
• Adjustments to Budget Years	-	-	25.592	-	25.592

Change Summary Explanation

FY 2020 was increased $25.592 million to support a network-wide evaluation. The test will assess the effectiveness of HMS systems within the Army network and support materiel release/acquisition milestone decisions.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	Project (Number/Name) FA1 / *Manpack Radio*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
FA1: *Manpack Radio*	-	1.248	1.957	30.622	-	30.622	39.422	36.335	13.945	15.300	0.000	138.829
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Tactical Network Radio Systems (Low-Tier) supports the Army Network Modernization Strategy Line of Effort 1, Unified Network

The HMS radios are a key component of the Integrated Tactical Network which supports a converged Mission Command Network that operates seamlessly worldwide in any environment. These radios will perform under a standards-based network architecture that unifies enterprise and deployed network capabilities. The near-term goal of the HMS radios is to provide 'secure but unclassified' networking capabilities utilizing next generation tactical radios. The cited work is consistent with Strategic Planning Guidance and the Mission Command Network Modernization Implementation Plan.

HMS is structured as a single program of record consisting of several products. The Manpack (MP) radio is a NSA certified Type 1 radio used for transmission of up to SECRET information. The MP is capable of providing two simultaneous channels of secure voice and data communications using SINCGARS, 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 Line of Sight (LOS) / Beyond Line of Sight (BLOS) voice and data communications. The MP will serve as the vehicular and man-packable tactical LOS / BLOS radio.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Program Management	0.548	0.450	0.550
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.			
FY 2019 Plans: During this timeframe, will provide overall management and oversight to implement PdM HMS acquisition strategy. Includes Matrix and Contractor support.			
FY 2020 Plans: During this timeframe, will provide overall management and oversight to implement PdM HMS acquisition strategy. Includes Matrix and Contractor support.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA1 / *Manpack Radio*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
An increase in funding is necessary to support a network-wide evaluation planned for FY 2020.			
Title: HMS Engineering/Technical Support ***Description:*** Overall technical analysis support to PdM HMS' Manpack products. ***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. ***FY 2020 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 achieving tactical radio objectives. Technical test support includes: planning and execution of laboratory and field test events, support for testing of prototypes, EDMs, commercial radio solutions, Developmental and Operational Test events, and data collection/reduction/analysis of tactical radio performance. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** An increase in funding is necessary to support a network-wide evaluation planned for FY 2020.	0.700	0.700	1.000
Title: Test and Evaluation ***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. 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	-	0.744	29.072

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA1 / *Manpack Radio*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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. ***FY 2019 Plans:*** 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. ***FY 2020 Plans:*** The FY 2020 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. HMS is planning a network evaluation event in FY 2020 to assess required capabilities, operational efficacy, and interoperability across the communications network. In FY 2020 the Army intends to test and integrate 2-channel communications technologies in support of Air to Ground experimentation. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** An increase in funding is necessary to support a network-wide evaluation planned for FY 2020. The test will assess the effectiveness of HMS systems within the Army network and support materiel release/acquisition milestone decisions.			
Title: FY 2019 SBIR / STTR Transfer ***Description:*** Accounting for FY 2019 SBIR/ STTR Transfer. ***FY 2019 Plans:*** Accounting for FY 2019 SBIR/ STTR Transfer. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 Decrease to account for SBIR/ STTR transfer	-	0.063	-
Accomplishments/Planned Programs Subtotals	1.248	1.957	30.622

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• FA2: *Rifleman Radio (RR)*	7.597	1.868	5.032	-	5.032	10.875	11.033	12.290	12.310	0.000	61.005

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA1 / *Manpack Radio*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• B95004: *Handheld Manpack Small Form Fit (HMS)*	415.351	298.475	468.026	-	468.026	526.565	609.206	774.369	697.280	Continuing	Continuing

Remarks

D. Acquisition Strategy

MP Radio is currently executing a May 2014 approved acquisition strategy to procure Non-Developmental Items (NDI). Utilizing a full and open competition strategy, the MP base contract was awarded to all potential industry partners. The MP contract was awarded on 26 February 2016, and procures NDI MP radios for use in a classified environment. The MP is currently 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 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. Awarded LRIP delivery order (30 April 2018)
e. Award LRIP delivery orders based on best value trade-off construct (3QFY19 & 3QFY20)
f. Achieve Full Rate Production (2QFY21)

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	Project (Number/Name) FA1 / *Manpack Radio*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Management Office Support	Various	PEO C3T, CECOM, PM TR Alliant : Various; APG, MD	0.312	0.548		0.450	Dec 2018	0.550		-		0.550	0.000	1.860	-
FY 2019 SBIR / STTR Transfer	TBD	Various : Various	-	-		0.063		-		-		-	0.000	0.063	-
		Subtotal	0.312	0.548		0.513		0.550		-		0.550	0.000	1.923	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
HMS Engineering/ Technical Support	Various	PEO C3T, ARL, ESP, CECOM, CERDEC, LCMC : Various	1.142	0.700		0.700	Jan 2019	1.000		-		1.000	0.000	3.542	-
		Subtotal	1.142	0.700		0.700		1.000		-		1.000	0.000	3.542	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Follow on Delta Development & Testing	Various	EPG : Ft. Huachuca	2.447	-		-		-		-		-	0.000	2.447	-
Follow on Delta Development & Testing (2)	Various	OTC : TBD	6.446	-		0.744	Nov 2018	29.072		-		29.072	0.000	36.262	-
		Subtotal	8.893	-		0.744		29.072		-		29.072	0.000	38.709	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	10.347	1.248		1.957		30.622		-		30.622	0.000	44.174	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	Project (Number/Name) FA1 / *Manpack Radio*	

	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA1 / *Manpack Radio*

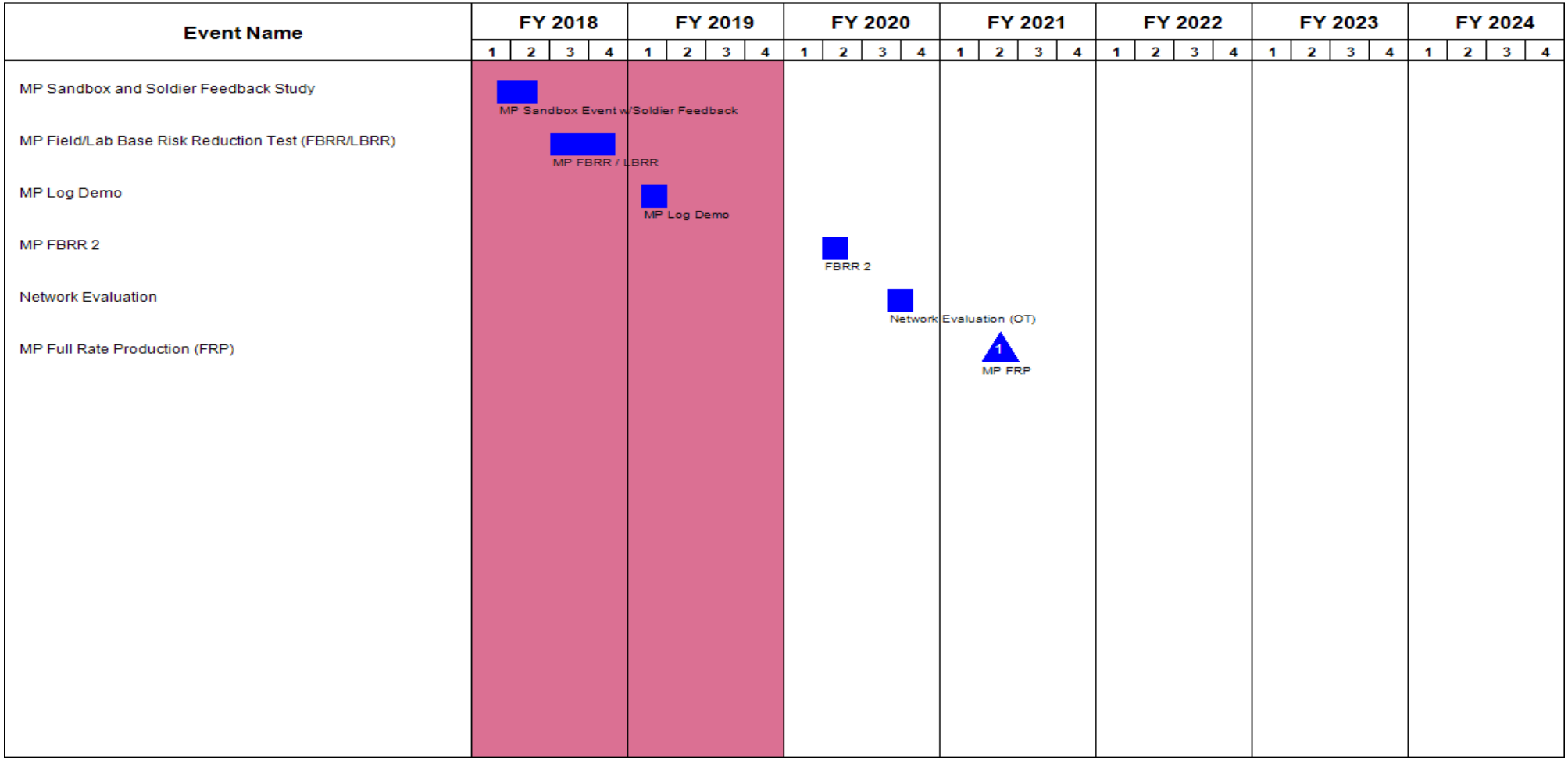

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA1 / *Manpack Radio*

Schedule Details

	Start		End	
Events	**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 Log Demo	1	2019	1	2019
MP FBRR 2	2	2020	2	2020
Network Evaluation	3	2020	4	2020
MP Full Rate Production (FRP)	2	2021	2	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	Project (Number/Name) FA2 / *Rifleman Radio (RR)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
FA2: *Rifleman Radio (RR)*	-	7.597	1.868	5.032	-	5.032	10.875	11.033	12.290	12.310	0.000	61.005
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Tactical Network Radio Systems (Low-Tier) supports the Army Network Modernization Strategy Line of Effort 1, Unified Network

The HMS radios are a key component of the Integrated Tactical Network which supports a converged Mission Command Network that operates seamlessly worldwide in any environment. These radios will perform under a standards-based network architecture that unifies enterprise and deployed network capabilities. The near-term goal of the HMS radios is to provide 'secure but unclassified' networking capabilities utilizing next generation tactical radios. The cited work is consistent with Strategic Planning Guidance and the Mission Command Network Modernization Implementation Plan.

HMS is structured as a single program of record consisting of several products. The HMS Handheld products 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 certified Type 1 radio used for transmission of up to SECRET information. The RR provides one-channel secure voice and data communications. 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 and other advanced networking waveform communications, in one radio with both handheld and mounted configurations, for fixed and mobile sites.

On 13 September 2016 the Army Acquisition Executive approved a decreased Basis of Issue (BOI) for the single channel RR, an increase to the BOI for the two channel 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 2018	FY 2019	FY 2020
Title: Program Management	0.485	0.425	0.475
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 2019 Plans: During this timeframe, will provide overall management and oversight to implement HMS acquisition strategy. Includes Matrix and Contractor support.			
FY 2020 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA2 / *Rifleman Radio (RR)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
During this timeframe, will provide overall management and oversight to implement HMS acquisition strategy. Includes Matrix and Contractor support. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** An increase in funding is necessary to support a network-wide evaluation planned for FY 2020.			
Title: HMS Engineering/Technical Support ***Description:*** Overall technical analysis support to PdM HMS' Handheld products. ***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. ***FY 2020 Plans:*** Provide technical systems engineering support to evaluate technical alternatives and perform communication architecture analysis to identify alternatives to reduce cost, improve performance, and achieving tactical radio objectives. Technical test support for the planning and execution of laboratory and field test events, including support for testing of prototypes, EDMs, commercial radio solutions, Developmental and Operational Test events, and data collection/reduction/analysis of tactical radio performance. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** An increase in funding is necessary to support a network-wide evaluation planned for FY 2020.	0.300	0.300	0.400
Title: Test and Evaluation ***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. 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	6.812	1.083	4.157

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA2 / *Rifleman Radio (RR)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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. ***FY 2019 Plans:*** 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. ***FY 2020 Plans:*** The FY 2020 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. In FY 2020 the Army intends to test and integrate 2-channel communications technologies in support of Air to Ground experimentation. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** An increase in funding is necessary to support a network-wide evaluation planned for FY 2020. The test will assess the effectiveness of HMS systems within the Army network and support materiel release/acquisition milestone decisions.			
Title: FY 2019 SBIR/ STTR Transfer ***Description:*** Accounting for FY 2019 SBIR/ STTR Transfer. ***FY 2019 Plans:*** Accounting for FY 2019 SBIR/ STTR Transfer. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 Decrease to account for SBIR/ STTR transfer.	-	0.060	-
Accomplishments/Planned Programs Subtotals	7.597	1.868	5.032

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• FA1: *Manpack Radio*	1.248	1.957	30.622	-	30.622	39.422	36.335	13.945	15.300	0.000	138.829
• B95004: *Handheld Manpack Small Form Fit (HMS)*	415.351	298.475	468.026	-	468.026	526.565	609.206	774.369	697.280	Continuing	Continuing

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA2 / *Rifleman Radio (RR)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

On 13 September 2016 the Army Acquisition Executive determined to decrease the Basis of Issue (BOI) for the single channel RR, increase the BOI for the two channel 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 Indefinite Delivery Indefinite Quantity (IDIQ) RR base contract (awarded 29 April 2015) to on-ramp LR capabilities (18 September 2018). The LR effort is a separate competition under the Handheld radio suite.

The LR will simultaneously run Single Channel Ground and Airborne Radio System (SINCGARS) and other advanced networking waveforms, in one radio with both handheld and mounted configurations, for fixed and mobile sites.

The Army will procure radios through a multiple step selection process:
a. Awarded FFP Contracts to all qualified vendors based on technical acceptability and demonstrations (18 September 2018)
b. Awarded LRIP delivery orders to support SFAB and ITN fieldings/evaluations (18 September 2018)
c. Award LRIP delivery orders based on results the best value trade-off construct (3QFY19 & 3QFY20)

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	Project (Number/Name) FA2 / *Rifleman Radio (RR)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total 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	0.485		0.425	Dec 2018	0.475		-		0.475	0.000	1.758	-
FY 2019 SBIR/ STTR Transfer	TBD	Various : Various	-	-		0.060		-		-		-	0.000	0.060	-
		Subtotal	0.373	0.485		0.485		0.475		-		0.475	0.000	1.818	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total 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	0.300		0.300	Jan 2019	0.400		-		0.400	0.000	1.154	-
		Subtotal	0.154	0.300		0.300		0.400		-		0.400	0.000	1.154	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Follow on Delta Development & Testing	Various	EPG : Fort Huachuca	2.676	2.100		-		-		-		-	0.000	4.776	-
Follow on Delta Development & Testing (2)	Various	OTC : TBD	0.648	4.712		1.083	Nov 2018	4.157		-		4.157	0.000	10.600	-
		Subtotal	3.324	6.812		1.083		4.157		-		4.157	0.000	15.376	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	3.851	7.597		1.868		5.032		-		5.032	0.000	18.348	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	Project (Number/Name) FA2 / *Rifleman Radio (RR)*	

	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA2 / *Rifleman Radio (RR)*

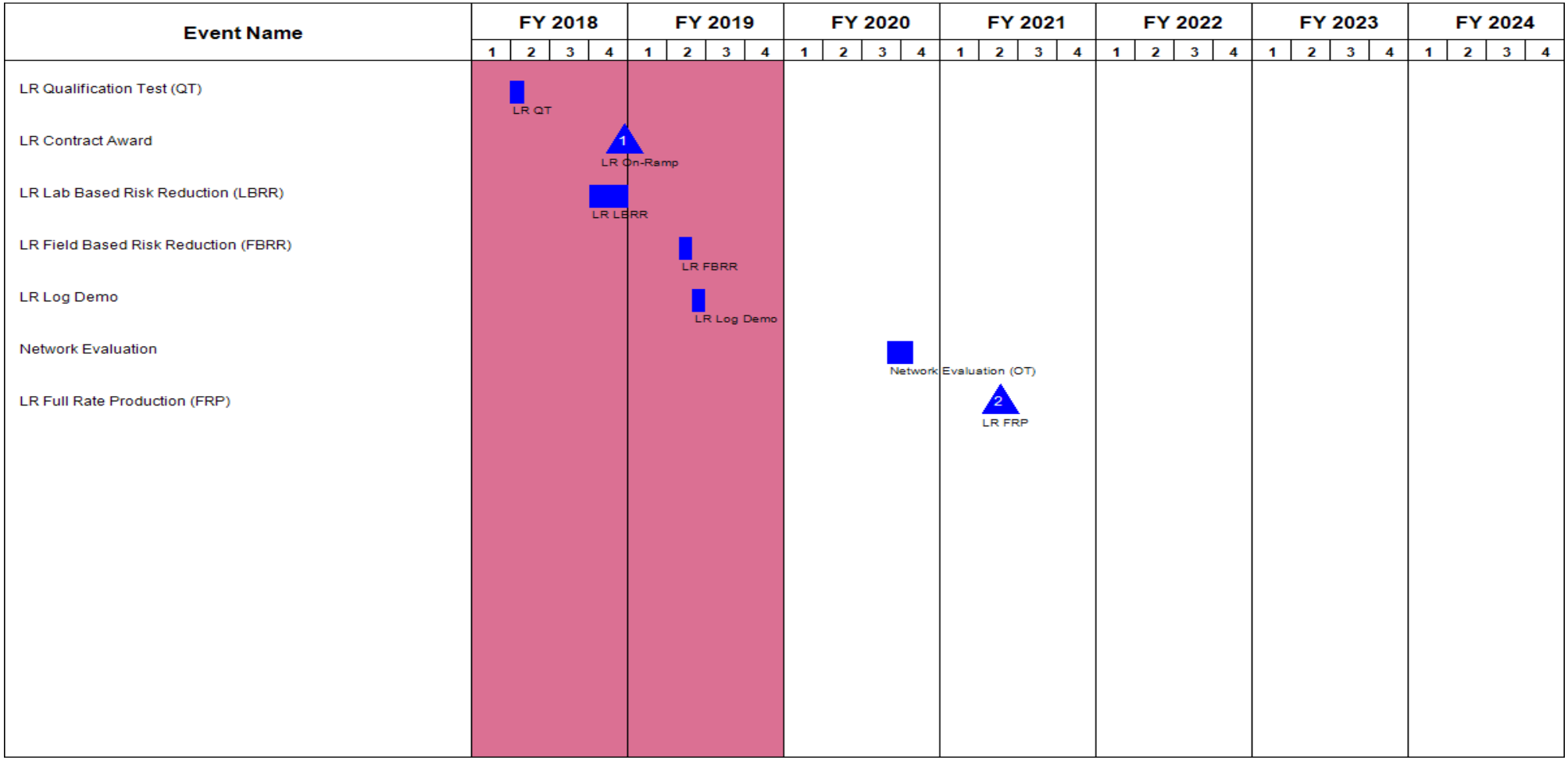

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605042A / *Tactical Network Radio Systems (Low-Tier)*	**Project (Number/Name)** FA2 / *Rifleman Radio (RR)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
LR Qualification Test (QT)	1	2018	2	2018
LR Contract Award	4	2018	4	2018
LR Lab Based Risk Reduction (LBRR)	4	2018	4	2018
LR Field Based Risk Reduction (FBRR)	2	2019	2	2019
LR Log Demo	2	2019	2	2019
Network Evaluation	3	2020	4	2020
LR Full Rate Production (FRP)	2	2021	2	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army												Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605047A *I Contract Writing System*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	19.574	41.876	19.682	-	19.682	13.034	8.847	0.000	0.000	0.000	103.013
FA7: *Contract Writing System*	-	19.574	41.876	19.682	-	19.682	13.034	8.847	0.000	0.000	0.000	103.013

Note

Effective February 2, 2017, the Department of Defense 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 (ACWS). 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 (MDA), as outlined in DoDI 5000.75, are referred to as "Authority To Proceed" and replace DoDI 5000.02 "Milestones." ACWS official MDA delegation to Program Executive Office, Enterprise Information Systems was on 19 March 2018.

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. 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, the Army received an Office of Secretary of Defense (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 Request For Proposal (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 request for proposal to industry to procure a Commercial-off-the-Shelf (COTS) system. Since awarding a contract to CGI Federal Inc. on 22 May 2017, the program recently completed a robust risk reduction effort that aligned Army's business processes to the selected commercial-off-the-shelf product, and reduced unnecessary requirements and interfaces. In August 2018, program conducted a successful Baseline Authority to Proceed decision and obtained the Army Acquisition Executive's approval to award initial development task order. ACWS is on track to deploy a Minimum Viable Solution (MVS) to two pilot units in late FY 2019 / early FY 2020, and achieve Initial Operational Capability (IOC) NLT 3Q FY 2020.

ACWS was approved by The Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)) as one of the pilot programs supporting the FY 2018 National Defense Authorization Act (NDAA) Section 873 Agile Pilots. The duration of the ACWS 873 Pilot Program is planned through Full Development. As part of the Sec 873 activities ACWS is realigning and restructuring during the IOC development which will include a contract structure that enables Agile best practices and incremental capability delivery to the field. ACWS, as Sec 873 Agile Pilot Program, will support OSD need to quickly identify lessons learned, reduce procedural delays, improve policy, and enhance workforce training. Sec 873 Pilot Programs, such as ACWS, are intended to deliver greater capability to the Army rapidly and at lowered costs.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605047A / *Contract Writing System*

Sec 873 Pilot provides programs the opportunity to restructure in order to streamline contract and acquisition approaches and tear down barriers to agile development without penalty. Lessons learned will be used to help shape agile policy, processes and tools for DoD.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	20.322	41.928	20.375	-	20.375
Current President's Budget	19.574	41.876	19.682	-	19.682
Total Adjustments	-0.748	-0.052	-0.693	-	-0.693
• Congressional General Reductions	-0.015	-0.052			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.733	-			
• Adjustments to Budget Years	-	-	-0.693	-	-0.693

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605047A / *Contract Writing System*	Project (Number/Name) FA7 / *Contract Writing System*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
FA7: *Contract Writing System*	-	19.574	41.876	19.682	-	19.682	13.034	8.847	0.000	0.000	0.000	103.013
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 ERP systems. As a financial feeder system, ACWS will meet the compliance requirements of the Federal Financial Management Improvement Act of 1996. 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 USD(AT&L) memorandum; DoD Functional Contract Writing and Administration, dated 21 October 2011, which directed each of the Services to develop a new contract writing system. Accordingly, the Army received an OSD DCMO validated problem statement and the Army Acquisition Executive approved the ACWS MDD on 29 October 2014. On 24 March 2016, the USD(AT&L) signed the program's RFP Release ADM which designated ACWS as an unbaselined, Major Automated Information System Acquisition Category IAM program, and approved the Army's request to release an request for proposal to industry to procure a COTS system. Since awarding a contract to CGI Federal Inc. on 22 May 2017, the program recently completed a robust risk reduction effort that aligned Army's business processes to the selected commercial-off-the-shelf product, and reduced unnecessary requirements and interfaces. In August 2018, program conducted a successful Baseline Authority to Proceed decision and obtained the Army Acquisition Executive's approval to award initial development task order. ACWS is on track to deploy a Minimum Viable Solution (MVS) to two pilot units in late FY 2019 / early FY 2020, and achieve Initial Operational Capability (IOC) NLT 3Q FY 2020.

ACWS was approved by The Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)) as one of the pilot programs supporting the FY 2018 National Defense Authorization Act (NDAA) Section 873 Agile Pilots. The duration of the ACWS 873 Pilot Program is planned through Full Development. As part of the Sec 873 activities ACWS is realigning and restructuring during the IOC development which will include a contract structure that enables Agile best practices and incremental capability delivery to the field. ACWS, as Sec 873 Agile Pilot Program, will support OSD need to quickly identify lessons learned, reduce procedural delays, improve policy, and enhance workforce training. Sec 873 Pilot Programs, such as ACWS, are intended to deliver greater capability to the Army rapidly and at lowered costs. Sec 873 Pilot provides programs the opportunity to restructure in order to streamline contract and acquisition approaches and tear down barriers to agile development without penalty. Lessons learned will be used to help shape agile policy, processes and tools for DoD.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Acquisition, Testing, and Deployment Phase	19.574	41.876	19.682
Description: During the Acquisition, Testing, and Deployment Phase the program will perform all development, integration, test, and deployment activities for two pilot sites, and two software releases (IOC and Full Deployment (FD)) to achieve full deployment of ACWS capabilities to 10,000 end users in approximately 300 locations worldwide.			
FY 2019 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605047A / *Contract Writing System*	**Project (Number/Name)** FA7 / *Contract Writing System*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 funds will be used to develop a MVS software release and deploy to a small pilot unit in 3Q. Funds will also be used for hosting to deploy ACWS with a government-approved cloud solution provider. ***FY 2020 Plans:*** ACWS will deploy the MVS software release to a second small pilot organization in FY 2020 and will then deliver the IOC release to both pilot units that previously received the MVS release. ACWS will train both pilot sites on the IOC release and will select one of the pilot organization to participate in an Initial Operational Test that will validate the capability in an operational environment and allow the Functional Sponsor to declare that the program has achieved IOC. ACWS will achieve IOC in fourth quarter FY 2020 and prepare for the deployment of the IOC capability to the Army Contracting Enterprise in early FY 2021. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** ACWS has implemented an agile approach to developing and delivering capability in order to deploy two pilot units.			
Accomplishments/Planned Programs Subtotals	19.574	41.876	19.682

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• B66001: *Contract Writing System*	1.001	5.927	15.000	-	15.000	8.468	5.827	-	-	0.000	36.223

Remarks

The FY 2020 base procurement funds procures requisite ACWS software licenses for IOC (estimated delivery to approximately 4,500 users for receiving IOC capability). The license procurement in FY 2020 supports pre-deployment activities including establishing both training and deployment teams for the IOC Release which will be deployed in first quarter FY 2021. The funding also supports and system fielding activities (Organization Change Management) throughout the Acquisition, Testing, and Deployment Phase.

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. Risk reduction activities include Business Process Re-engineering, 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 (MVS). The ACWS strategy consists of an agile development software release approach in order to reach FD, followed by 60 months of sustainment activities during the Capability Support Phase.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605047A / *Contract Writing System*	Project (Number/Name) FA7 / *Contract Writing System*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Office	Various	PdM ACWS : Arlington, VA	5.979	7.260		7.800	Oct 2018	7.900	Oct 2019	-		7.900	0.000	28.939	-
		Subtotal	5.979	7.260		7.800		7.900		-		7.900	0.000	28.939	N/A

Remarks

FY20 projected costs include PMO contractor support labor, HW/SW tools, supplies, facility updates, and travel expenses.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	Option/ Various	CGI Federal : Arlington, VA	13.889	10.614		31.576	Oct 2018	7.782	Oct 2019	-		7.782	0.000	63.861	-
		Subtotal	13.889	10.614		31.576		7.782		-		7.782	0.000	63.861	N/A

Remarks

FY20 projected costs include the development of the IOC Release capability. Hosting (IaaS) and managed services are also included as a requirement on the ACWS Product Development SI Contract with CGI Federal.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Security	IA	ARL & NETCOM : ARL CSSP in AWS GovCloud West	-	1.500		1.500	Oct 2018	1.500	Oct 2019	-		1.500	0.000	4.500	-
		Subtotal	-	1.500		1.500		1.500		-		1.500	0.000	4.500	N/A

Remarks

FY20 projected costs include IA/RMF activities, and required services from a Cyber Security Support Provider (Army Research Lab) for the Cloud Solution Provider's government approved hosting environment.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605047A / *Contract Writing System*	Project (Number/Name) FA7 / *Contract Writing System*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	MIPR	ATEC : TBD	-	0.200		1.000	Oct 2018	2.500	Oct 2019	-		2.500	0.000	3.700	-
		Subtotal	-	0.200		1.000		2.500		-		2.500	0.000	3.700	N/A

Remarks

FY20 projected costs include integrated testing activities with ATEC and JTIC for the the two pilot sites in order to achieve a Limited Deployment decision(s).

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	19.868	19.574		41.876		19.682		-		19.682	0.000	101.000	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605047A / *Contract Writing System*	**Project (Number/Name)** FA7 / *Contract Writing System*

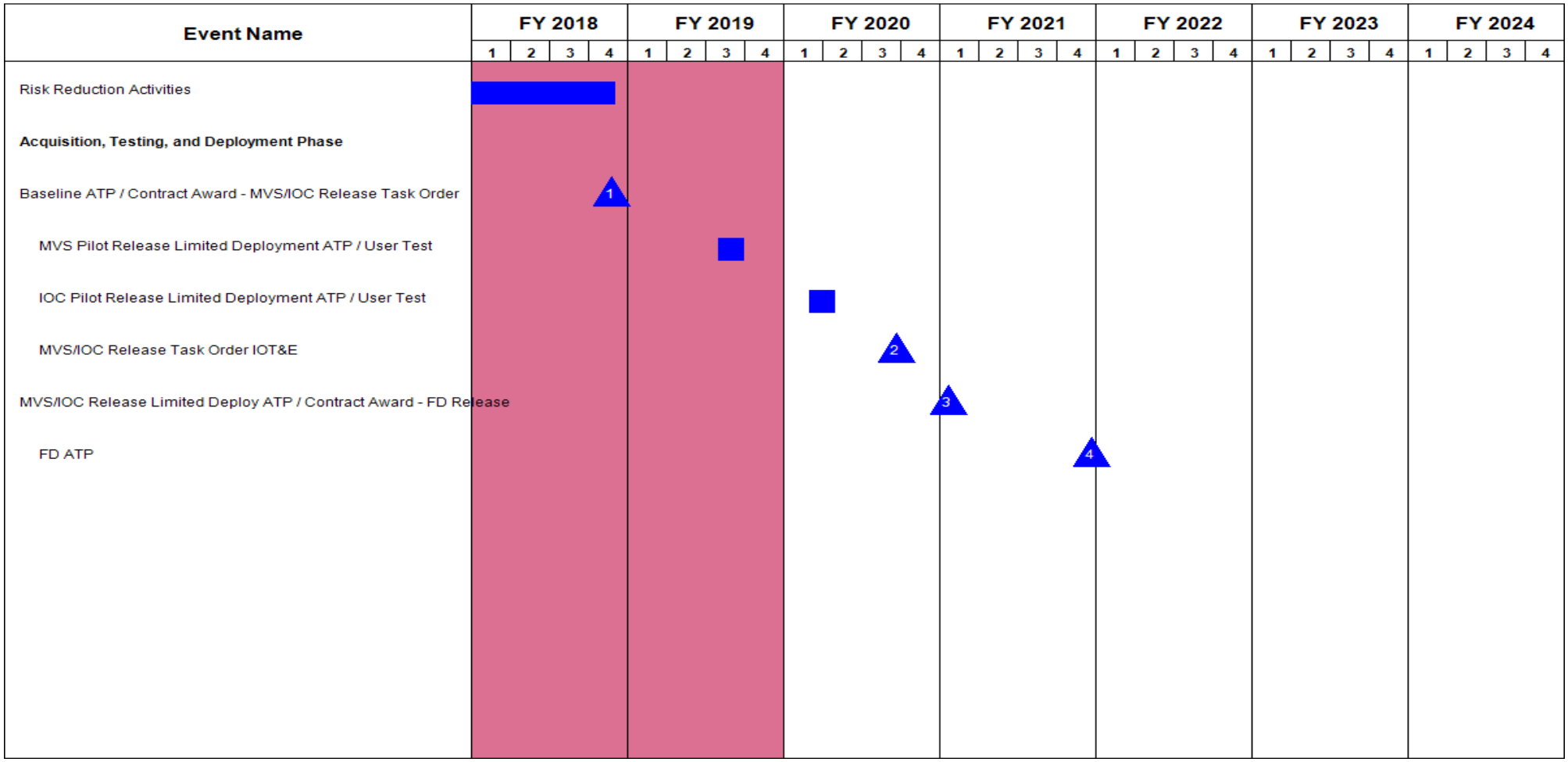

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605047A / *Contract Writing System*	**Project (Number/Name)** FA7 / *Contract Writing System*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Risk Reduction Activities	3	2017	4	2018
Acquisition, Testing, and Deployment Phase	3	2016	2	2022
Baseline ATP / Contract Award - MVS/IOC Release Task Order	4	2018	4	2018
MVS Pilot Release Limited Deployment ATP / User Test	3	2019	3	2019
IOC Pilot Release Limited Deployment ATP / User Test	1	2020	2	2020
MVS/IOC Release Task Order IOT&E	3	2020	3	2020
MVS/IOC Release Limited Deploy ATP / Contract Award - FD Release	1	2021	1	2021
FD ATP	4	2021	4	2021

Note

Then program tailored the BCAC process by adding a Baseline Authority to Proceed with the MDA to review the results of the Preliminary Design Review and obtain approval of the cost, schedule and performance baseline for Task Order 0002.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605049A *I Missile Warning System Modernization (MWSM)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	12.480	8.266	1.539	-	1.539	1.551	1.752	1.739	1.739	0.000	29.066
XT4: *Advanced Threat Detection System (ATDS)*	-	12.480	8.266	1.539	-	1.539	1.551	1.752	1.739	1.739	0.000	29.066

A. Mission Description and Budget Item Justification

ATDS will provide enhanced missile warning capabilities for current and future Army rotary-wing, small fixed wing, tilt-rotor platforms, and Special Operations rotary wing aircraft. Primary capability achieved through ATDS is the agility necessary to rapidly react to evolving threats.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	55.810	28.276	90.129	-	90.129
Current President's Budget	12.480	8.266	1.539	-	1.539
Total Adjustments	-43.330	-20.010	-88.590	-	-88.590
• Congressional General Reductions	-0.011	-0.010			
• Congressional Directed Reductions	-42.810	-20.000			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.509	-			
• Adjustments to Budget Years	-	-	-88.590	-	-88.590

Change Summary Explanation

FY 2018, FY 2019, and FY 2020 funding were decreased based on delayed Material Development Decision (MDD) which required an updated strategy. Army Acquisition Executive (AAE) was briefed 22 Oct 2018. Per policy, the estimated dollar value meets the criteria for an Acquisition Category (ACAT) II program. As such, the PEO issued an Acquisition Decision Memorandum (ADM) authorizing the PM to evaluate candidate technologies to protect aircraft from emerging MANPADS threats to inform an acquisition strategy before returning in 2nd Quarter FY 2020.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605049A / *Missile Warning System Modernization (MWSM)*	Project (Number/Name) XT4 / *Advanced Threat Detection System (ATDS)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
XT4: *Advanced Threat Detection System (ATDS)*	-	12.480	8.266	1.539	-	1.539	1.551	1.752	1.739	1.739	0.000	29.066
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

ATDS will provide enhanced missile warning capabilities for current and future Army rotary-wing, small fixed wing, tilt-rotor platforms, and Special Operations rotary wing aircraft. Primary capability achieved through ATDS is the agility necessary to rapidly react to evolving threats.

Justification:
FY 2020 Base Research Development Test and Evaluation (RDTE) dollars in the amount of $1.539 million funds enhanced market research and system engineering program management, and engineering support for an advanced missile warning system. The program is evaluating candidate technologies capable of being developed and fielded to the US Army to protect aircraft from emerging Man Portable Air Defense Systems (MANPADS).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: ATDS ***Description:*** Develop, test, integrate, and field an advanced missile warning system. ***FY 2019 Plans:*** FY 2019 Base RDTE dollars in the amount of $7.321 million will fund enhanced market research activities to assess existing and/or proposed technologies available for future development. ***FY 2020 Plans:*** FY 2020 Base RDTE dollars in the amount of $1.539 million will fund enhanced market research activities to assess existing and/or proposed technologies available for future development. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decrease was due to MDD delay.	12.480	7.321	1.539
Title: FY 2019 SBIR / STTR Transfer ***Description:*** FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:***	-	0.945	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605049A / *Missile Warning System Modernization (MWSM)*	**Project (Number/Name)** XT4 / *Advanced Threat Detection System (ATDS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 SBIR / STTR Transfer			
Accomplishments/Planned Programs Subtotals	12.480	8.266	1.539

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

ATDS is pre-MDD. Army Acquisition Executive (AAE) was briefed 22 Oct 2018. Per policy, the estimated dollar value meets the criteria for an ACAT II program. As such, the PEO issued an Acquisition Decision Memorandum (ADM) authorizing the PM to evaluate candidate technologies to protect aircraft from emerging MANPADS threats to inform an acquisition strategy before returning in 2QFY2020.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605049A / *Missile Warning System Modernization (MWSM)*	Project (Number/Name) XT4 / *Advanced Threat Detection System (ATDS)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering Program Management - SEPM	TBD	PM ASE : HSV, AL	-	1.291		1.700	Jan 2019	1.539	Oct 2019	-		1.539	0.000	4.530	Continuing
FY 2019 SBIR / STTR Transfer	TBD	Various : Various	-	-		0.945		-		-		-	0.000	0.945	-
		Subtotal	-	1.291		2.645		1.539		-		1.539	0.000	5.475	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Material Solution Analysis	TBD	PM ASE : HSV, AL	-	1.700		1.406	Mar 2019	-		-		-	0.000	3.106	Continuing
Laboratory Updates	TBD	PM ASE : HSV, AL	-	1.718		1.405	Mar 2019	-		-		-	0.000	3.123	Continuing
Software Development	Various	Various : PM ASE, HSV, AL	-	-		1.405	Mar 2019	-		-		-	0.000	1.405	Continuing
Analysis of Alternatives	Various	Various : Various	-	7.604		1.405		-		-		-	0.000	9.009	Continuing
		Subtotal	-	11.022		5.621		-		-		-	0.000	16.643	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Support	TBD	PM ASE : HSV, AL	-	0.167		-		-		-		-	0.000	0.167	Continuing
		Subtotal	-	0.167		-		-		-		-	0.000	0.167	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	12.480		8.266		1.539		-		1.539	0.000	22.285	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605049A / *Missile Warning System Modernization (MWSM)*	**Project (Number/Name)** XT4 / *Advanced Threat Detection System (ATDS)*

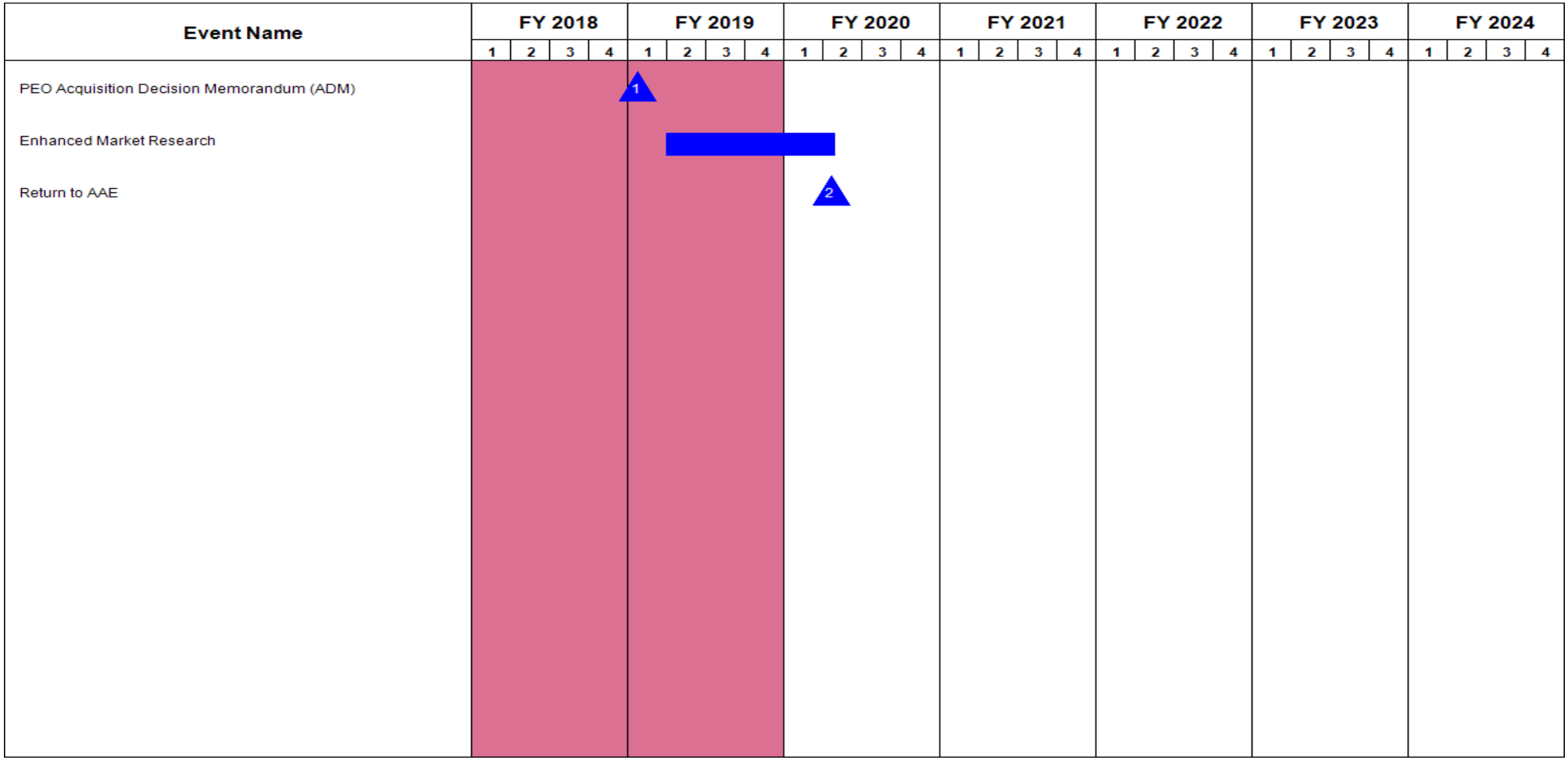

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605049A / *Missile Warning System Modernization (MWSM)*	**Project (Number/Name)** XT4 / *Advanced Threat Detection System (ATDS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
PEO Acquisition Decision Memorandum (ADM)	1	2019	1	2019
Enhanced Market Research	2	2019	2	2020
Return to AAE	2	2020	2	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army												Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605051A / *Aircraft Survivability Development*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	169.752	56.871	64.557	77.420	141.977	92.449	14.440	18.707	16.186	0.000	510.382
ER7: *Aircraft Survivability Equipment Development*	-	25.120	16.143	58.772	-	58.772	9.933	7.692	11.821	8.240	0.000	137.721
ER8: *Common Missile Warning System (CMWS)*	-	144.632	40.728	5.785	77.420	83.205	82.516	6.748	6.886	7.946	0.000	372.661

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 Phase 3 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, the APR-39C(V)1/4, serves as an obsolescence / sustainment upgrade to the Processor Line Replaceable Unit (LRU) of the AN/APR-39A(V) Radar Warning Receiver (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 2A is 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. Phase 2B, the APR-39E(V)2 (MRWR), is an Army Engineering Change Proposal (ECP) to the APR-39D(V)2 that will implement enhanced hardware and software upgrades to keep the APR-39 technically relevant against new and emerging agile threats.

Phase 3 adds active Electronic Countermeasures (ECM) jamming capability for selected aircraft; Material Development Decision (MDD) for this ECM capability phase is not expected until later in the Future Years Defense Program (FYDP).

Justification: FY 2020 Base RDT&E funding of $58.772 million supports APR-39E(V)2 system development and prototyping.

ER8: Common Missile Warning System (CMWS).
The CMWS program is a missile warning system that cues both flare and laser-based countermeasures to defeat incoming Inrared (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 ultraviolet (UV) missile detection data from Electro-Optic Missile Sensors (EOMS), which detect UV signals, 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.

As a part of Phase 2a of the JUONS (SO-0010) program, the Army has now integrated the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system onto the Apache, Blackhawk, and Chinook platforms. Due to a number of challenges, circumstances, and variables, the Army updated the ATW/ CIRCM QRC and LIMWS Directed Requirements (dated 16 November 2018). The updated requirements extend the utilization of ATW DoN LAIRCM on conventional Army aircraft and cancel the need for the ATW/CIRCM QRC system for the conventional Army. (It should be noted that the updated requirement maintains the need for ATW/CIRCM on the Special Operations aircraft.) As a result, the Army will no longer acquire the ATW sensors for use in Phase 3 of the JUONS effort. Instead, the Army will accelerate the procurement of the CIRCM QRC systems for use with the currently fielded Common Missile Warning System (CMWS) in preparation for transition to the Limited Interim Missile Warning System (LIMWS) system when available.

Phase 4 Limited Interim Missile Warning System (LIMWS) QRC: Phase 4 LIMWS QRC addressess the HQDA Directed Requirement to provide a greater capability than the current Program of Record (POR), CMWS, to bridge the gap between CMWS and the future POR.

Justification:
CMWS: FY 2020 Base Research, Development, Test, and Evaluation (RDTE) dollars in the amount of $5.785 million funds threat and vulnerability analysis, and Systems Engineering Program Management (SEPM).

Phase 3 Common Infrared Countermeasure Quick Reaction Capability (Phase 3, CIRCM QRC): FY 2020 Overseas Contingency Operations (OCO) RDTE dollars in the amount of $2.220 million fund System Test & Evaluation (ST&E) and tech manual development.

Phase 4 Limited Interim Missile Warning System (LIMWS) QRC: FY2020 Overseas Contingency Operations (OCO) RDTE dollars in the amount of $75.200 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

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605051A *I Aircraft Survivability Development*

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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	60.979	56.898	22.712	-	22.712
Current President's Budget	169.752	56.871	64.557	77.420	141.977
Total Adjustments	108.773	-0.027	41.845	77.420	119.265
• Congressional General Reductions	-0.025	-0.027			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	110.000	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.202	-			
• Adjustments to Budget Years	-	-	41.845	77.420	119.265

Change Summary Explanation

FY 2018 adjustment of $108.773 adds funding for ER8 Product Development

FY 2020 Adjustment of $119.265 adds funding for ER7 and ER8 Product Development.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
ER7: *Aircraft Survivability Equipment Development*	-	25.120	16.143	58.772	-	58.772	9.933	7.692	11.821	8.240	0.000	137.721
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, the APR-39C(V)1/4, serves as an obsolescence / sustainment upgrade to the Processor Line Replaceable Unit (LRU) of the APR-39A(V) Radar Warning Receiver (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 2A is 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. Phase 2B, the APR-39E(V)2 (MRWR), is an Army Engineering Change Proposal (ECP) to the APR-39D(V)2 that will implement enhanced hardware and software upgrades to keep the APR-39 technically relevant against new and emerging agile threats.

Phase 3 adds active Electronic Countermeasures (ECM) jamming capability for selected aircraft; Material Development Decision (MDD) for this ECM capability phase is not expected until later in the Future Years Defense Program (FYDP).

Justification: FY 2020 Base RDT&E funding of $58.772 million supports APR-39E(V)2 system development and prototyping.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Phase 2 Radio Frequency Countermeasure (CM)	25.120	16.143	58.772	-	58.772
Description: Phase 2 RWR Modernization					
FY 2019 Plans: Will fund APR-39E(V)2 hardware and software development.					
FY 2020 Base Plans: Will fund APR-39E(V)2 hardware and software development, prototyping, and integration.					
FY 2019 to FY 2020 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER7 / *Aircraft Survivability Equipment Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2020 includes increased Base RDT&E funding for additional hardware and software development, prototyping, and integration for APR-39E(V)2.					
Accomplishments/Planned Programs Subtotals	25.120	16.143	58.772	-	58.772

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• AZ3511: *Radio Frequency CM*	54.843	51.135	46.353	-	46.353	65.043	92.599	160.306	140.848	0.000	611.127

Remarks

D. Acquisition Strategy

Army Radio Frequency (RF) ASE is managed by Project Manager ASE (PM ASE) for development, testing, procurement, integration and installation on Army rotary wing and fixed wing Special Electronic Mission Aircraft (SEMA) 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, the APR-39C(V)1/4, addresses obsolescence/Diminishing Manufacturing Sources (DMS) issues associated with the currently fielded AN/APR-39A(V) Radar Warning Receiver (RWR) via sole source Engineering Change Proposal (ECP) awarded to the APR-39A(V) manufacturer.

Phase 2A 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 Phase 2B development, testing, procurement, and fielding of the APR-39E(V)2 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 (ECM) jamming capability for selected aircraft.

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E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / *Aircraft Survivability Development*	Project (Number/Name) ER7 / *Aircraft Survivability Equipment Development*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Threat Management	Various	Various : -	8.839	0.284		0.324		2.631	Nov 2019	-		2.631	Continuing	Continuing	-
Project Management	Various	Various : -	1.595	0.258		0.358	Nov 2018	3.243	Nov 2019	-		3.243	Continuing	Continuing	-
FY 2019 SBIR / STTR Transfer	TBD	various : -	-	-		0.592		-		-		-	0.000	0.592	-
		Subtotal	10.434	0.542		1.274		5.874		-		5.874	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total 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	-
APR-39E(V)2 SW & HW Development	Various	OGA : Aberdeen Proving Grounds, MD	10.136	22.910		14.869	Dec 2018	42.898	Jan 2020	-		42.898	Continuing	Continuing	-
Threat and Vulnerablity Analysis/Sil Updates	MIPR	I2WD : Aberdeen Proving Grounds, MD	2.547	-		-		-		-		-	Continuing	Continuing	-
Depot Standup	MIPR	Tobyhanna : Tobyhanna, PA	1.063	-		-		-		-		-	0.000	1.063	-
APR-39E(V)2 Platform Integration	Various	Multiple : -	4.516	0.036		-		10.000	Jan 2020	-		10.000	Continuing	Continuing	-
		Subtotal	28.896	22.946		14.869		52.898		-		52.898	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Support	Various	Various : -	4.182	0.503		-		-		-		-	Continuing	Continuing	-
Matrix Support	Various	Various : -	6.800	-		-		-		-		-	Continuing	Continuing	-
		Subtotal	10.982	0.503		-		-		-		-	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605051A / *Aircraft Survivability Development*	Project (Number/Name) ER7 / *Aircraft Survivability Equipment Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
DT/OT	Various	Various : -	3.060	0.379		-		-		-		-	Continuing	Continuing	-
Government System Test and Evaluation	Various	Various : -	20.059	0.750		-		-		-		-	Continuing	Continuing	-
		Subtotal	23.119	1.129		-		-		-		-	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	73.431	25.120		16.143		58.772		-		58.772	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER7 / *Aircraft Survivability Equipment Development*

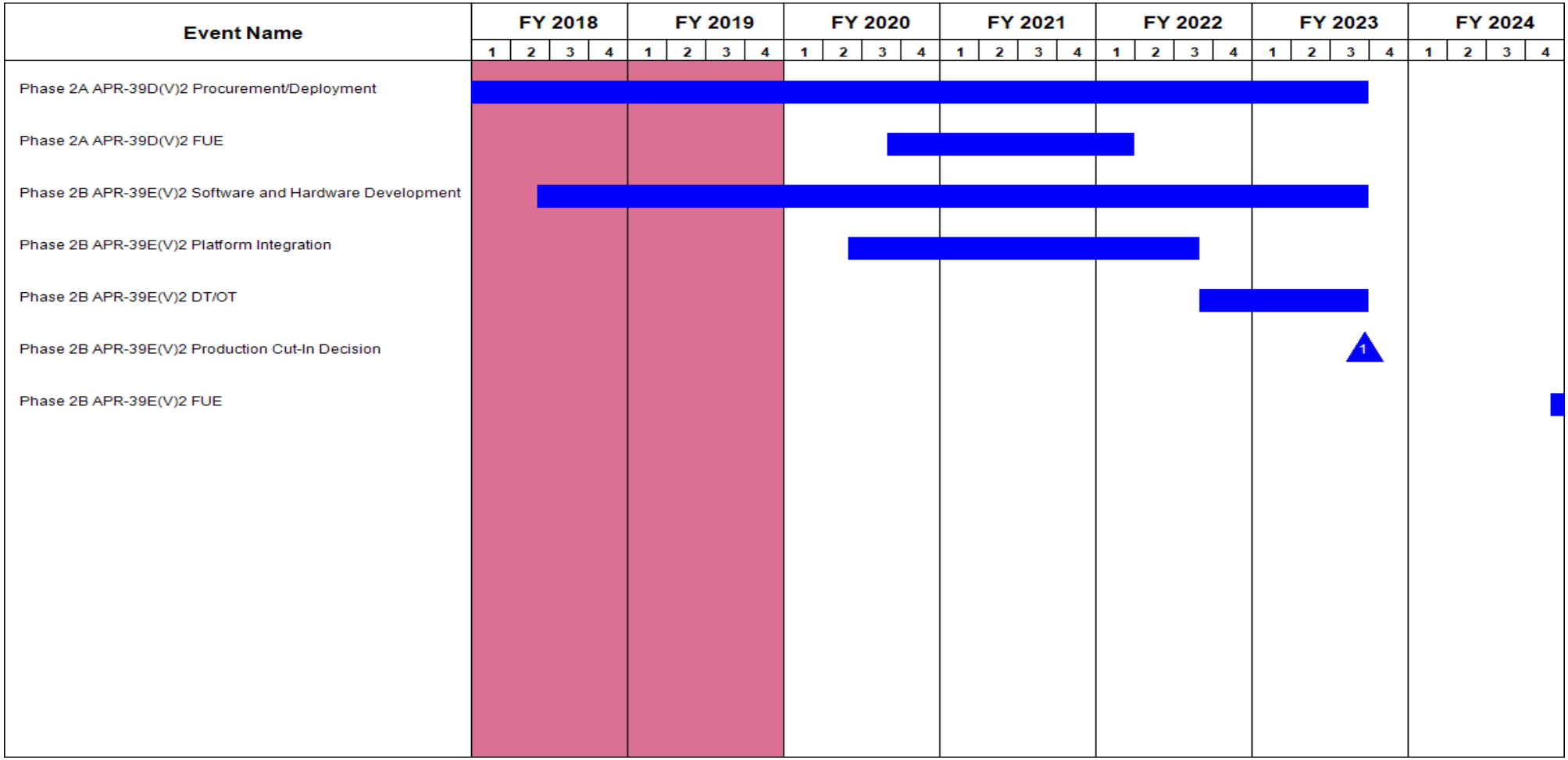

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER7 / *Aircraft Survivability Equipment Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Threat Vulnerability Analysis//SIL Updates	3	2016	4	2017
Phase 2A APR-39D(V)2 Procurement/Deployment	4	2017	3	2023
Phase 2A APR-39D(V)2 FUE	3	2020	1	2022
Phase 2B APR-39E(V)2 Software and Hardware Development	2	2018	3	2023
Phase 2B APR-39E(V)2 Platform Integration	2	2020	3	2022
Phase 2B APR-39E(V)2 DT/OT	3	2022	3	2023
Phase 2B APR-39E(V)2 Production Cut-In Decision	3	2023	3	2023
Phase 2B APR-39E(V)2 FUE	4	2024	1	2025

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
ER8: *Common Missile Warning System (CMWS)*	-	144.632	40.728	5.785	77.420	83.205	82.516	6.748	6.886	7.946	0.000	372.661
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The CMWS program is a missile warning system that cues both flare and laser-based countermeasures to defeat incoming Inrared (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 ultraviolet (UV) missile detection data from Electro-Optic Missile Sensors (EOMS), which detect UV signals, 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.

As a part of Phase 2a of the JUONS (SO-0010) program, the Army has now integrated the Department of the Navy Large Aircraft Infrared Countermeasure (DoN LAIRCM) system onto the Apache, Blackhawk, and Chinook platforms. Due to a number of challenges, circumstances, and variables, the Army updated the ATW/ CIRCM QRC and LIMWS Directed Requirements (dated 16 November 2018).
The updated requirements extend the utilization of ATW DoN LAIRCM on conventional Army aircraft and cancel the need for the ATW/CIRCM QRC system for the conventional Army. (It should be noted that the updated requirement maintains the need for ATW/CIRCM on the Special Operations aircraft.) As a result, the Army will no longer acquire the ATW sensors for use in Phase 3 of the JUONS effort. Instead, the Army will accelerate the procurement of the CIRCM QRC systems for use with the currently fielded Common Missile Warning System (CMWS) in preparation for transition to the Limited Interim Missile Warning System (LIMWS) system when available.

Phase 4 Limited Interim Missile Warning System (LIMWS) QRC: Phase 4 LIMWS QRC addressess the HQDA Directed Requirement to provide a greater capability than the current Program of Record (POR), CMWS, to bridge the gap between CMWS and the future POR.

Justification:

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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)*

CMWS: FY 2020 Base Research, Development, Test, and Evaluation (RDTE) dollars in the amount of $5.785 million will fund development engineering of Threat and Vulnerability Analysis and Systems Engineering Project Management (SEPM).

Phase 3 CIRCM QRC: FY 2020 Overseas Contingency Operations (OCO) RDTE dollars in the amount of $2.220 million will fund System Test & Evaluation (ST&E), technical manual development, and integration efforts to support the Phase 3 Common Infrared Countermeasure Quick Reaction Capability (CIRCM QRC) efforts.

Phase 4 Limited Interim Missile Warning System (LIMWS) Quick Reaction Capability (QRC) : FY 2020 Overseas Contingency Operations (OCO) RDTE dollars in the amount $75.200 million are estimated to fund system testing, design for lead platform, and development of follow-on platform designs.

Joint Staff, J-8 Deputy Director for Requirements (DOR) memorandum, April 24, 2015
SOCOM JUONs S0-0010, Joint Rapid Acquisition Cell (JRAC) memorandum, May 29, 2015 Directed Requirement for the 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 Limited Interim Missile Warning System (LIMWS) QRC, March 26, 2017.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: CMWS Product Development and Management Services ***Description:*** RDTE funding supports continuing development engineering threat and vulnerability analysis , salaries, and integration with other ASE Systems. ***FY 2019 Plans:*** FY 2019 Base RDTE dollars in the amount of $5.583 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 2020 Base Plans:*** FY 2020 Base RDTE dollars in the amount of $5.785 million will fund Product Development - Threat and Vulnerability Analysis and Management Services - CMWS Systems Engineering Program Management. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 includes decreased funding for CMWS Product Development and Management Services.	4.532	5.583	5.785	-	5.785
Title: Phase 3 CIRCM QRC OCO ***Description:*** Phase 3 CIRCM QRC will achieve a reduction in SWaP. ***FY 2019 Plans:***	30.100	5.110	0.000	2.220	2.220

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
There is no FY 2019 Base funding for this effort. ***FY 2020 Base Plans:*** There is no FY 2020 Base funding for this effort. ***FY 2020 OCO Plans:*** Phase 3 Common Infrared Countermeasure Quick Reaction Capability (CIRCM QRC): FY 2020 Overseas Contingency Operations (OCO) RDTE dollars in the amount of $2.220 million will fund System Test & Evaluation (ST&E), technical manual development, and integration efforts to support the CIRCM QRC efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 funding decreased for CIRCM QRC OCO as development is nearing completion.					
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 provide a greater capability than the current Program of Record (POR), CMWS, until the future POR is available. 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. FY 2020 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 Plans:*** There is no FY 2019 Base funding for this effort. ***FY 2020 Base Plans:*** There is no FY 2020 Base funding for this effort. ***FY 2020 OCO Plans:*** FY 2020 Overseas Contingency Operations (OCO) RDTE dollars in the amount of $75.200 million are estimated to fund system testing,design for lead platform, and development of follow-on platform designs. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 includes increased OCO RDT&E funding to continue the development and testing of LIMWS QRC.	110.000	29.823	0.000	75.200	75.200
Title: FY 2019 SBIR / STTR Transfer	-	0.212	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer					
Accomplishments/Planned Programs Subtotals	144.632	40.728	5.785	77.420	83.205

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• AZ3517: *CMWS*	197.467	97.883	13.999	130.219	144.218	140.796	10.040	8.277	8.514	0.000	607.195

Remarks

CIRCM QRC (Phase 3) is changing to maximize the Army fleet protection and meet operational requirements.

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.

Phase 2a JUONS DoN LAIRCM and Phase 3 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.

Threat and Vulnerability Analysis combines the same efforts as Vulnerability Analysis and Assessment of Technologies (VAAT) and Threat Analysis Database (TAD).

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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)*

Future Sensor Algorithm Analysis is critically important because this line support the entire Missile Warning Portfolio. Funds supporting future sensor algorithm analysis and development equally supports MANPADS and Hostile Fire overmatch for the entire Missile Warning Portfolio.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CMWS Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	8.554	0.331		0.586	Jan 2019	0.587	Jan 2020	-		0.587	Continuing	Continuing	Continuing
Advanced Missile Warning System Systems Engineering Program Management	TBD	TBD : TBD	2.000	-		-		-		-		-	0.000	2.000	-
JUONS SO-0010 Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	1.627	-		-		-		-		-	0.000	1.627	-
CIRCM QRC Systems Engineering Program Management	Various	Various : PM ASE, HSV, AL	7.144	1.000		-		-		-		-	Continuing	Continuing	Continuing
LIMWS - SEPM	Various	Various : PM ASE, HSV, AL	5.634	1.222		0.489		0.000		0.494	Jan 2019	0.494	0.000	7.839	-
FY 2019 SBIR / STTR Transfer	TBD	Various : Various	-	-		0.212		-		-		-	0.000	0.212	-
		Subtotal	24.959	2.553		1.287		0.587		0.494		1.081	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CMWS tier 2/3 Upgrades	Various	Various : -	2.000	-		-		-		-		-	Continuing	Continuing	Continuing
CMWS Threat Analysis Database Design	Various	BAE : Various	0.455	-		-		-		-		-	0.000	0.455	-
CMWS Threat Analysis Database (TAD)	Various	BAE : Various	6.119	-		-		-		-		-	0.000	6.119	-
CMWS Enhanced Sensor Study & Evaluation	Various	Various : -	11.466	-		-		-		-		-	0.000	11.466	-
CMWS Data Modeling	TBD	Various : Various	0.688	-		-		-		-		-	0.000	0.688	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CMWS Future Sensor and Algorithm Analysis	Various	Various : TBD	1.035	1.589		1.938	Mar 2019	2.150	Mar 2020	-		2.150	0.000	6.712	-
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
JUONS SO-0010 Prime Contractor -- Integration Engineering	Various	Various : Various	8.842	-		-		-		-		-	0.000	8.842	-
JUONS SO-0010 Software	Various	Various : Various	1.534	-		-		-		-		-	0.000	1.534	-
JUONS SO-0010 Training	Various	Various : Various	0.200	-		-		-		-		-	0.000	0.200	-
CIRCM QRC Development Engineering	Various	Northrup Grumman : Rolling Meadow, IL	-	5.100		-		-		-		-	0.000	5.100	-
CIRCM QRC System Development and Qualification	Various	Various : Various	53.474	-		-		-		-		-	Continuing	Continuing	Continuing
CIRCM QRC Aircraft Integration	Various	Various : Various	24.223	-		-		-		-		-	Continuing	Continuing	Continuing
Limited Interim Missile Warning System (LIMWS) - Development Engineering	Various	Various : PM ASE, HSV, AL	21.234	97.029		10.893		0.000		48.840	Mar 2020	48.840	0.000	177.996	-
CMWS Threat and Vulnerability Analysis	Various	Various : TBD	-	2.612		3.059	Mar 2019	3.048	Mar 2020	-		3.048	Continuing	Continuing	Continuing
		Subtotal	162.031	106.330		15.890		5.198		48.840		54.038	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LIMWS - Matrix Support	Various	Various : PM ASE, HSV, AL	2.433	4.005		3.260		0.000		3.161	Jan 2020	3.161	0.000	12.859	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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)*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
LIMWS - Contractor Support	Various	Various : PM ASE, HSV, AL	2.433	3.599		6.086		0.000		3.865	Jan 2020	3.865	0.000	15.983	-
		Subtotal	4.866	7.604		9.346		0.000		7.026		7.026	0.000	28.842	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CMWS Test and Evaluation	TBD	Various : Various	16.156	-		-		-		-		-	Continuing	Continuing	Continuing
JUONS SO-0010 Test and Evaluation	Various	Various : Various	26.709	-		-		-		-		-	0.000	26.709	-
CIRCM QRC Test and Evaluation/Tech Manuals	Various	Various : Various	3.720	24.000		5.110		0.000		2.220	Mar 2020	2.220	Continuing	Continuing	Continuing
LIMWS - Government Testing	Various	Various : PM ASE, HSV, AL	-	4.145		9.095		0.000		18.840	Mar 2020	18.840	0.000	32.080	-
		Subtotal	46.585	28.145		14.205		0.000		21.060		21.060	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	238.441	144.632		40.728		5.785		77.420		83.205	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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)*

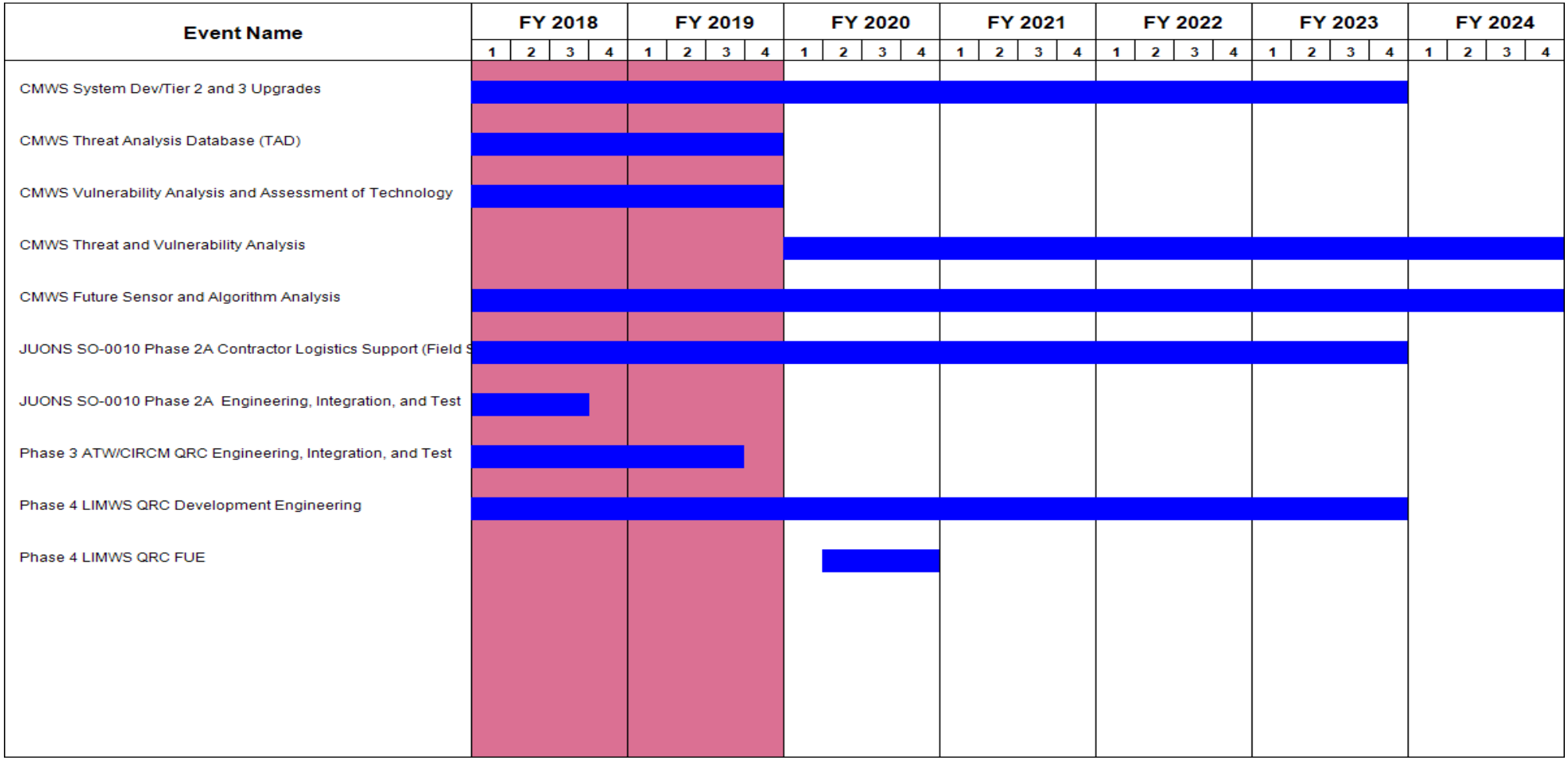

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605051A / *Aircraft Survivability Development*	**Project (Number/Name)** ER8 / *Common Missile Warning System (CMWS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CMWS System Dev/Tier 2 and 3 Upgrades	2	2011	4	2023
CMWS Gen 3 Production	3	2012	4	2016
CMWS Threat Analysis Database (TAD)	2	2012	4	2019
CMWS Vulnerability Analysis and Assessment of Technology	2	2015	4	2019
CMWS Threat and Vulnerability Analysis	1	2020	4	2024
CMWS Future Sensor and Algorithm Analysis	1	2017	4	2024
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 Development Engineering	3	2017	4	2023
Phase 4 LIMWS QRC FUE	2	2020	4	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605052A *I Indirect Fire Protection Capability Inc 2 - Block 1*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	156.361	132.283	243.228	-	243.228	101.000	58.000	45.000	5.000	0.000	740.872
EY7: *IFPC Increment 2 - Block 1*	-	156.361	132.283	243.228	-	243.228	101.000	58.000	45.000	5.000	0.000	740.872

Note

IFPC Inc 2 system development funding realigned from BA4, PE 0604319A/DU3 to BA5, PE 0605052A/EY7 beginning in FY 2017.

Expanded Mission Area Missile (EMAM) program funding realigned from BA4, PE 0604319A/DU3 to BA5, PE 0605052A/EY7 beginning in FY 2020 in support of enduring IFPC capability.

A. Mission Description and Budget Item Justification

The Indirect Fire Protection Capability Increment 2 (IFPC Inc 2) will provide a ground-based weapon system designed to acquire, track, engage, and defeat Cruise Missiles (CM), Unmanned Aircraft Systems (UAS), and Rocket, Artillery, and Mortar (RAM) threats. The IFPC Inc 2 system consists of a launcher, integrated fire control, sensor, and an interceptor to support the Threshold CM and UAS defeat mission. The Objective counter-RAM mission employs both alternative kinetic and non-kinetic defeat solutions.

In FY 2018, the Army evaluated alternative strategies to address an Army interim CM defense (CMD) capability at critical strategic fixed site locations while continuing the development of an enduring capability. As reported on 31 Oct 2018 the Army intends to field two interim IFPC batteries of Iron Dome in FY 2020, while concurrently componentizing a launcher and interceptor solutions that are interoperable and integrated with the Army Integrated Air and Missile Defense (AIAMD) open systems architecture, IAMD Battle Command System (IBCS), and the Sentinel sensor by FY 2023. For each of the interim capability's Iron Dome Batteries, the Army intends to employ a configuration that matches the Israeli Firing Unit. Prior to making a final decision on the enduring solution, the Army plans to conduct experimentation and analysis with Army sensors and IBCS to determine the complexity of integration of the componentized launcher and interceptor solution. The final decision point, planned for 2QFY2020, will decide between a componentized Iron Dome launcher or a CMD launcher from industry for the enduring IFPC Inc 2 capability.

This budget request assumes approval of the 2019 Above Threshold Reprogramming request which aligns FY 2018 and FY 2019 funding to the plan provided in the IFPC Acquisition Strategy Report submitted to Congress.

FY 2020 Base dollars in the amount of $243.228 million are designated for the integration and testing of the interim IFPC capability ($74.645 million) and supporting development and integration of the componentized enduring IFPC Inc 2 system ($168.583 million).

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army					Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605052A *I Indirect Fire Protection Capability Inc 2 - Block 1*		
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	175.069	157.710	77.599	-	77.599
Current President's Budget	156.361	132.283	243.228	-	243.228
Total Adjustments	-18.708	-25.427	165.629	-	165.629
• Congressional General Reductions	-0.132	-0.164			
• Congressional Directed Reductions	-12.200	-25.263			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-6.376	-			
• Adjustments to Budget Years	-	-	165.629	-	165.629

Change Summary Explanation

Funding decrease in FY 2018 of $5.589 million for Small Business Innovative Research (SBIR), $0.787 million for Small Business Technology Transfer Research (STTR), $0.132 million for Federally Funded Research and Development Centers (FFRDC), and $12.200 million from a Congressional Reduction for developmental testing early to need.

Funding decrease in FY 2019 of $0.164 million for Federally Funded Research and Development Centers (FFRDC), and $25.263 million from a Congressional Reduction for developmental testing early to need.

The FY 2020 increase of $165.629 million supports the revised IFPC Acquisition Strategy outlined in the Report to Congress.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	Project (Number/Name) EY7 / *IFPC Increment 2 - Block 1*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EY7: *IFPC Increment 2 - Block 1*	-	156.361	132.283	243.228	-	243.228	101.000	58.000	45.000	5.000	0.000	740.872
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

IFPC Inc 2 system development funding realigned from BA4, PE 0604319A/DU3 to BA5, PE 0605052A/EY7 beginning in FY 2017.

Expanded Mission Area Missile (EMAM) program funding realigned from BA4, PE 0604319A/DU3 to BA5, PE 0605052A/EY7 beginning in FY 2020.

The project is supported by the Cross Functional Team (CFT), IFPC Inc 2.

A. Mission Description and Budget Item Justification

The Indirect Fire Protection Capability Increment 2 (IFPC Inc 2) will provide a ground-based weapon system designed to acquire, track, engage, and defeat Cruise Missiles (CM), Unmanned Aircraft Systems (UAS), and Rocket, Artillery, and Mortar (RAM) threats. The IFPC Inc 2 system consists of a launcher, integrated fire control, sensor, and an interceptor to support the Threshold CM and UAS defeat mission. The Objective counter-RAM mission employs both alternative kinetic and non-kinetic defeat solutions.

In FY 2018, the Army evaluated alternative strategies to address an Army interim CM defense (CMD) capability at critical strategic fixed site locations while continuing the development of an enduring capability. As reported on 31 Oct 2018 the Army intends to field two interim IFPC batteries of Iron Dome in FY 2020, while concurrently componentizing a launcher and interceptor solutions that are interoperable and integrated with the Army Integrated Air and Missile Defense (AIAMD) open systems architecture, IAMD Battle Command System (IBCS), and the Sentinel sensor by FY 2023. For each of the interim capability's Iron Dome Batteries, the Army intends to employ a configuration that matches the Israeli Firing Unit. Prior to making a final decision on the enduring solution, the Army plans to conduct experimentation and analysis with Army sensors and IBCS to determine the complexity of integration of the componentized launcher and interceptor solution. The final decision point, planned for 2QFY2020, will decide between a componentized Iron Dome launcher or a CMD launcher from industry for the enduring IFPC Inc 2 capability.

This budget request assumes approval of the 2019 Above Threshold Reprogramming request which aligns FY 2018 and FY 2019 funding to the plan provided in the IFPC Acquisition Strategy Report submitted to Congress.

FY 2020 Base dollars in the amount of $243.228 million are designated for the integration and testing of the interim IFPC capability ($74.645 million) and supporting development and integration of the componentized enduring IFPC Inc 2 system ($168.583 million).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: IFPC Inc 2-I Block 1 MML Development, Integration, and Testing	128.861	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: Activities supporting the pre-EMD IFPC Inc 2-I Blk 1 launcher ceased in FY 2018					
Title: Interim IFPC Inc 2 Integration and Testing	27.500	91.963	74.645	-	74.645
Description: Funding is provided to support the assessment of operational utility and safety of the Iron Dome system as an Interim IFPC Inc 2 capability ***FY 2019 Plans:*** - Continue RDT&E efforts associated with Interim IFPC Inc 2 CMD system integration and testing - Continue system engineering and software development efforts to enable Interim IFPC Inc 2 Iron Dome system to interoperate with US systems utilizing a US external command and control system - Conduct review and analysis of prior Israeli Iron Dome Test events for applicability to US test requirements (Environmental tests, Electromagnetic Environmental Effects tests, Insensitive Munitions tests and assessments, Health Hazard tests, Functional Hazard Analysis, Explosive Hazard Classification tests, Hazardous Materials Assessment) for each major End Item and support vehicles of the system - Initiate Cyber Security Analysis activities to review and analyze available Israeli cybersecurity documentation and obtain Authority to Operate - Continue US hardware, software, and interface development and integration - Continue System Performance Assessment and Modeling and Simulation efforts - Perform system engineering, integration, logistics engineering, system test and evaluation management, technical configuration control, and business management activities - Conduct Risk Management activities - Perform logistics assessments to determine training requirements, fielding requirements, spares packages, and required documentation ***FY 2020 Base Plans:*** - Continue RDT&E efforts associated with Interim IFPC Inc 2 CMD system integration and testing - Continue system engineering and software development efforts to enable Interim IFPC Inc 2 Iron Dome system to interoperate with US systems utilizing a US external command and control system - Continue review and analysis of prior Israeli Iron Dome Test events for applicability to US test requirements (Environmental tests, Electromagnetic Environmental Effects tests, Insensitive Munitions tests and assessments, Health Hazard tests, Functional Hazard Analysis, Explosive Hazard Classification tests, Hazardous Materials Assessment) for each major End Item and support vehicles of the system - Continue Cyber Security Analysis activities to obtain Authority to Operate					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Conduct Safety Testing of Interim IFPC Inc 2 system - Conduct Performance Analysis and Testing of Interim IFPC Inc 2 system - Conduct Capabilities and Limitations Testing of Interim IFPC Inc 2 system - Continue US hardware, software, and interface development and integration - Continue System Performance Assessment and Modeling and Simulation efforts - Continue US hardware, software, and interface development and integration - Continue system engineering, integration, logistics engineering, system test and evaluation management, technical configuration control, and business management activities - Continue Risk Management activities - Continue logistics assessments to determine training requirements, fielding requirements, spares packages, and required documentation - Conduct Reliability Data Analysis (Operational Availability, Failure Reports, missile BIT results) for the system and each major End Item and support vehicle of the system - Conduct Verification and Validation of Training Support Package Materials for all system major End Items equipment and support vehicles of the system - Conduct CLS for test articles ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding realigned IAW 31 Oct 2018 Report to Congress to integrate and support the determination of the operational utility and safety of the Iron Dome system as interim IFPC Inc 2 CMD					
Title: Enduring IFPC Inc 2 Integration and Testing	-	13.760	168.583	-	168.583
Description: Funding is provided to support the development, integration, and testing of the Enduring IFPC Inc 2 capability ***FY 2019 Plans:*** - Continue RDT&E efforts associated with Enduring IFPC Inc 2 development - Observe USMC Iron Dome Missile Firing Unit (MFU) with Tamir interceptor experimentation with USMC CAC2S and USMC GATOR Radar - Conduct US Army Iron Dome Missile Firing Unit (MFU) with Tamir interceptor experimentation with IBCS and Sentinel Radar - Redesign of prototype launchers to support All-up Round Magazine development - Conduct All-up Round Magazine development and integration activities					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
- Perform system engineering, integration, logistics engineering, system test and evaluation management, technical configuration control, and business management activities - Continue engineering and technical support of Enduring IFPC Inc 2 hardware, software and interface development and integration - Perform technical assessments, concept studies, cost reduction, risk management, and required documentation determination					
FY 2020 Base Plans: - Continue RDT&E efforts associated with Enduring IFPC Inc 2 development - Conduct modified prototype launcher and interceptor All-up Round Magazine experimentation with IBCS and Sentinel Radar - Initiate detailed design activities following the US Army final Decision Briefing for the IFPC Inc 2 system - Conduct launcher componentization activities (Communications and Data Uplink) - Conduct interceptor componentization (Weapons Interface Controller and Engagement Calculator software development) - Perform system engineering, integration, logistics engineering, system test and evaluation management, technical configuration control, and business management activities - Conduct Cybersecurity Analysis events (Cooperative Vulnerability Identification, Adversarial Cybersecurity Development Test & Evaluation, Interim Authority to Operate) - Continue engineering and technical support of Enduring IFPC Inc 2 hardware, software and interface development and integration - Perform technical assessments, concept studies, cost reduction, risk management, final design, and required documentation - Award interceptor development,integration and test Other Transaction Authority (OTA) - Complete interceptor hardware and software design - Build Enduring IFPC interceptor prototypes - Begin Enduring IFPC interceptor component qualification - Begin Enduring IFPC interceptor qualification - Begin Enduring IFPC interceptor model accredited - Begin Enduring IFPC interceptor integration with launcher - Begin Enduring IFPC interceptor Integration with mission command					
FY 2019 to FY 2020 Increase/Decrease Statement:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Funding realigned IAW 31 Oct 2018 Report to Congress to support Enduring IFPC development activities					
Title: ATR - Realign to PE 0604319A MIPA funding line ***FY 2019 Plans:*** - IAW 31 Oct 18 Report to Congress, IFPC has requested an Above Threshold Reprogramming action to realign $20.900 million in FY 2019 funds from PE 0605052A/EY7 to be realigned to IFPC's PE 0604319A MIPA funding line to procure 2 Interim IFPC Iron Dome Batteries ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding requested to be realigned IAW 31 Oct 2018 Report to Congress to procure 2 Iron Dome Batteries in support of Interim IFPC	-	20.900	-	-	-
Title: FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer	-	5.660	-	-	-
Accomplishments/Planned Programs Subtotals	156.361	132.283	243.228	-	243.228

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• C53101: *MSE Missile*	1,103.040	1,131.276	0.000	736.541	736.541	767.495	749.530	999.731	898.131	793.430	7,179.174
• EF9: *System Integration and Test*	69.558	77.188	107.746	-	107.746	111.080	121.308	37.186	40.999	0.000	565.065
• EX2: *Lower Tier Air Missile Defense (LTAMD) Capability*	57.437	89.248	427.772	-	427.772	376.738	332.322	241.461	87.500	0.000	1,612.478
• C50016: *System Integration and Test Procurement*	136.579	105.395	0.000	113.857	113.857	105.044	107.288	86.178	87.410	Continuing	Continuing
• DU3: *IFPC2*	10.871	40.979	0.000	-	0.000	-	-	-	-	0.000	51.850
• C62002: *IFPC INC 2-I BLOCK 1 SYSTEM*	-	31.286	0.000	9.337	9.337	241.387	446.464	424.568	446.541	0.000	1,599.583
• C62001: *IFPC Inc 2-I Block 1 Missile 1*	50.056	145.636	0.000	-	0.000	-	-	-	-	0.000	195.692

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• E10: *Sentinel*	31.651	39.289	105.243	-	105.243	103.427	105.394	65.574	69.407	0.000	519.985
• S40: *Army Integrated Air and Missile Defense*	339.051	322.263	208.938	-	208.938	130.859	63.738	33.193	94.845	0.000	1,192.887
• BZ5075: *IAMD Battle Command System*	-	-	29.629	-	29.629	254.834	353.929	417.426	413.775	Continuing	Continuing
• 0604741A: *Air Defense Command, Control and Intelligence - Eng Dev*	190.385	212.373	43.502	-	43.502	24.944	7.068	1.228	3.405	0.000	482.905
• AD5070: *AIR & MSL Defense Planning & Control Sys*	132.713	29.913	24.730	14.331	39.061	49.147	106.671	63.143	0.075	0.000	420.723
• C62005: *IFPC INC 2-I Block 1 Missile 2*	-	-	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 (AIAMD) architecture.

D. Acquisition Strategy

As reported on 31 Oct 2018 the Army intends to rapidly field an interim capability with the Israeli Iron Dome and an enduring capability of a launcher leveraging the Army Integrated Air and Missile Defense (AIAMD) open systems architecture and IAMD Battle Command System (IBCS) as the Fire Control component, US sensor (Sentinel), and the employment of a variety of missiles.

In support of the Army's intent, a Directed Requirement to initiate procurement of the Israeli Iron Dome Missile System for an Interim IFPC CMD capability is being staffed for approval and IFPC has requested Above Threshold Reprogramming (ATR) actions to align funding in accordance with the Report to Congress. The ATR requested to repurpose $27.500 million FY 2018 funds and $91.963 million in FY 2019 funds from PE 0605052A/EY7 for Iron Dome experimentation and $36.000 million in FY 2018 procurement funds from PE 0604319A MIPA to procure 240 Tamir (Iron Dome) missiles. The ATR requested $31.286 million of FY 2019 PE 0604319A MIPA Advanced Procurement (originally for launcher long-lead items) and $20.900 million from PE 0605052A/EY7 to be realigned to IFPC's PE 0604319A MIPA funding line, along with the current $145.636 million from PE 0604319A MIPA to procure two interim Iron Dome batteries for assessment of operational utility under 10 U.S. code, paragraph 2373 (Procurement for Experimental Purposes). This budget request and Acquisition Strategy assumes approval of the 2019 ATR request which aligns FY 2018 and FY 2019 funding to the plan provided in the IFPC Acquisition Strategy Report submitted to Congress.

In support of the Interim IFPC solution in 2QFY2019, the Army is planning a 10 U.S. code, paragraph 2373 procurement contract to buy 2 Iron Dome batteries for technical evaluation, assessment of operational utility, and safety evaluation. Aligned with this procurement in FY 2019, IFPC will conduct Modeling and Simulation activities and integrating the hardware and software of the US communications suite with the Iron Dome systems. Additionally, IFPC will perform logistics analysis and assessments to determine Iron Dome training requirements, fielding requirement, spares packages, maintenance policies, and required Operational and Maintenance

documentation. In FY 2020, IFPC will continue its logistics assessments, Modeling and Simulation analysis, and integration activities, as well as conduct Safety Testing, Performance Analysis and Testing, and Capabilities and Limitations Testing of the Interim IFPC solution at White Sands Missile Range prior to their deployment for operational assessment.

In support of the Enduring IFPC solution, the Army is participating in multiple experiments and demonstrations of the Iron Dome system in the near future. The first is an experiment/demonstration to integrate the Iron Dome launcher and Tamir interceptor with U.S. sensors and networks. The second is an effort to assess the potential of integrating a CMD launcher from industry with the Tamir interceptor, Sentinel radar, and IBCS. In both instances, the U.S. Government is utilizing the Department of Defense Ordnance Technology Consortium (DOTC) Other Transaction Authority (OTA) process. IFPC has requested proposals for technology assessments that align with Iron Dome experimentation/demonstration. Information gained through these efforts will inform the Army's enduring IFPC solution decision as reported in the Army's IFPC Acquisition Strategy Report to Congress, submitted on 31 October 2018. The Army plans the above experimentation and analysis to determine the complexity of integration of the componentized launcher and interceptor solution prior to making a final decision on the Enduring IFPC solution. The final decision point, planned for 2QFY2020, will decide between a componentized Iron Dome launcher or a CMD launcher from industry for the enduring IFPC Inc 2 capability.

The Army verified technology readiness of missile alternatives in FY 2018 and will select one or more missiles to proceed in FY 2019. The Army will continue missile development, integration, and test to support Enduring IFPC Inc 2 Initial Operational Test & Evaluation in FY 2023.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	Project (Number/Name) EY7 / *IFPC Increment 2 - Block 1*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Launcher - PM - System Engineering	MIPR	Various : Huntsville, Alabama	-	2.822		-		-		-		-	0.000	2.822	-
Interim IFPC - PM - System Engineering	MIPR	Various : Huntsville, Alabama	-	-		2.884	Jan 2019	1.476	Oct 2019	-		1.476	0.000	4.360	-
Enduring IFPC - PM - System Engineering	MIPR	Various : Huntsville, Alabama	-	-		-		1.476	Oct 2019	-		1.476	Continuing	Continuing	Continuing
Enduring IFPC - PM Admin (SBIR/STTR/FFRDC)	Various	Various : Various	-	-		5.660	Jan 2019	6.542	Oct 2019	-		6.542	Continuing	Continuing	Continuing
		Subtotal	-	2.822		8.544		9.494		-		9.494	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Launcher System Engineering & Integration	Various	Multiple Activities : Multiple Locations	21.920	23.869	Oct 2017	-		-		-		-	0.000	45.789	-
Launcher Eng and Product Dev/Fabrication	Various	Multiple Activities : Multiple Locations	36.592	63.249	Oct 2017	-		-		-		-	0.000	99.841	-
Launcher System/ Subsystem Dev and Integration	MIPR	Multiple Activities : Multiple Locations	22.269	20.659	Oct 2017	-		-		-		-	0.000	42.928	-
Interim IFPC - System Engineering & Integration	Various	Multiple Activities : Multiple Locations	-	-		25.994	Jan 2019	11.761	Jan 2020	-		11.761	0.000	37.755	-
Interim IFPC Eng and Product Dev	Various	Multiple Activities : Multiple Locations	-	5.600	Feb 2019	17.909	Jan 2019	3.242	Oct 2019	-		3.242	0.000	26.751	-
Interim IFPC - System/ Subsystem Dev and Integration	Various	Multiple Activities : Multiple Locations	-	-		11.406	Jan 2019	16.937	Oct 2019	-		16.937	0.000	28.343	-
Enduring IFPC - System Eng & Integration	Various	Multiple Activities : Multiple Locations	-	-		-		14.693	Oct 2019	-		14.693	Continuing	Continuing	Continuing
Enduring IFPC Eng and Product Dev/Fabrication	Various	Multiple Activities : Multiple Locations	-	21.900	Feb 2019	13.760	Jan 2019	16.356	Oct 2019	-		16.356	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Enduring IFPC System/ Subsystem Dev and Integration	Various	Multiple Activities : Multiple Locations	-	-		-		3.288	Oct 2019	-		3.288	Continuing	Continuing	Continuing
Enduring IFPC Interceptor System Engineering & Integration	TBD	Multiple Activities : Multiple Locations	-	-		-		20.907	Oct 2019	-		20.907	Continuing	Continuing	Continuing
Enduring IFPC Interceptor System/Subsystem Development and Integration	SS/CPFF	To Be Determined : To Be Determined	-	-		-		94.942	Jan 2020	-		94.942	Continuing	Continuing	Continuing
		Subtotal	80.781	135.277		69.069		182.126		-		182.126	Continuing	Continuing	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Launcher PM Log Support	MIPR	Various : Huntsville, Alabama	-	1.428	Oct 2017	-		-		-		-	0.000	1.428	-
Launcher Log Support	TBD	TBD : TBD	-	4.101	Oct 2017	-		-		-		-	0.000	4.101	-
Interim IFPC - PM Log Support	MIPR	Various : Huntsville, Alabama	-	-		1.435	Oct 2018	1.461	Oct 2019	-		1.461	0.000	2.896	-
Interim IFPC - Log Support	TBD	TBD : TBD	-	-		11.559	Feb 2019	7.675	Dec 2019	-		7.675	0.000	19.234	-
Enduring IFPC Interceptor Log Support	Various	Multiple Activities : Redstone Arsenal, Alabama	-	-		-		2.071	Oct 2019	-		2.071	Continuing	Continuing	Continuing
		Subtotal	-	5.529		12.994		11.207		-		11.207	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	Project (Number/Name) EY7 / *IFPC Increment 2 - Block 1*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Launcher Developmental Testing	IA	Multiple Activities : Multiple Locations	-	12.733	Oct 2017	-		-		-		-	0.000	12.733	-
Interim IFPC Operational Testing	IA	Multiple Activities : Multiple Locations	-	-		20.776	Feb 2019	32.093	Oct 2019	-		32.093	0.000	52.869	-
Enduring IFPC Developmental Testing	IA	WSMR : WSMR	-	-		-		2.000	Oct 2019	-		2.000	Continuing	Continuing	Continuing
Enduring IFPC Interceptor System/Subsystem Developmental Testing	IA	Multiple Activities : Multiple Locations	-	-		-		6.308	Oct 2019	-		6.308	Continuing	Continuing	Continuing
ATR - Realign to PE 0604319A MIPA funding line	TBD	Army Budget Office : HQDA	-	-		20.900		-		-		-	0.000	20.900	-
		Subtotal	-	12.733		41.676		40.401		-		40.401	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	80.781	156.361		132.283		243.228		-		243.228	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

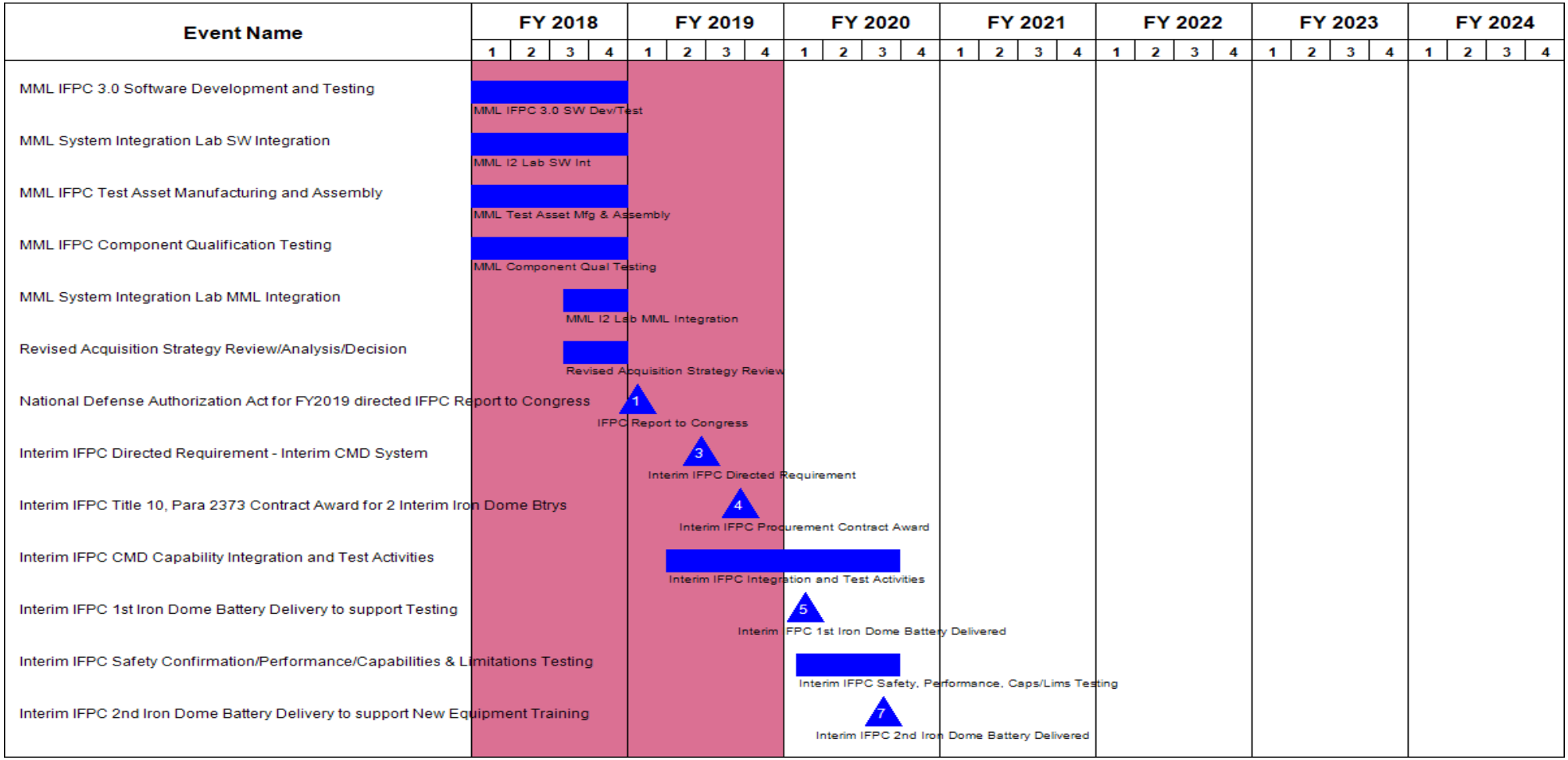

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

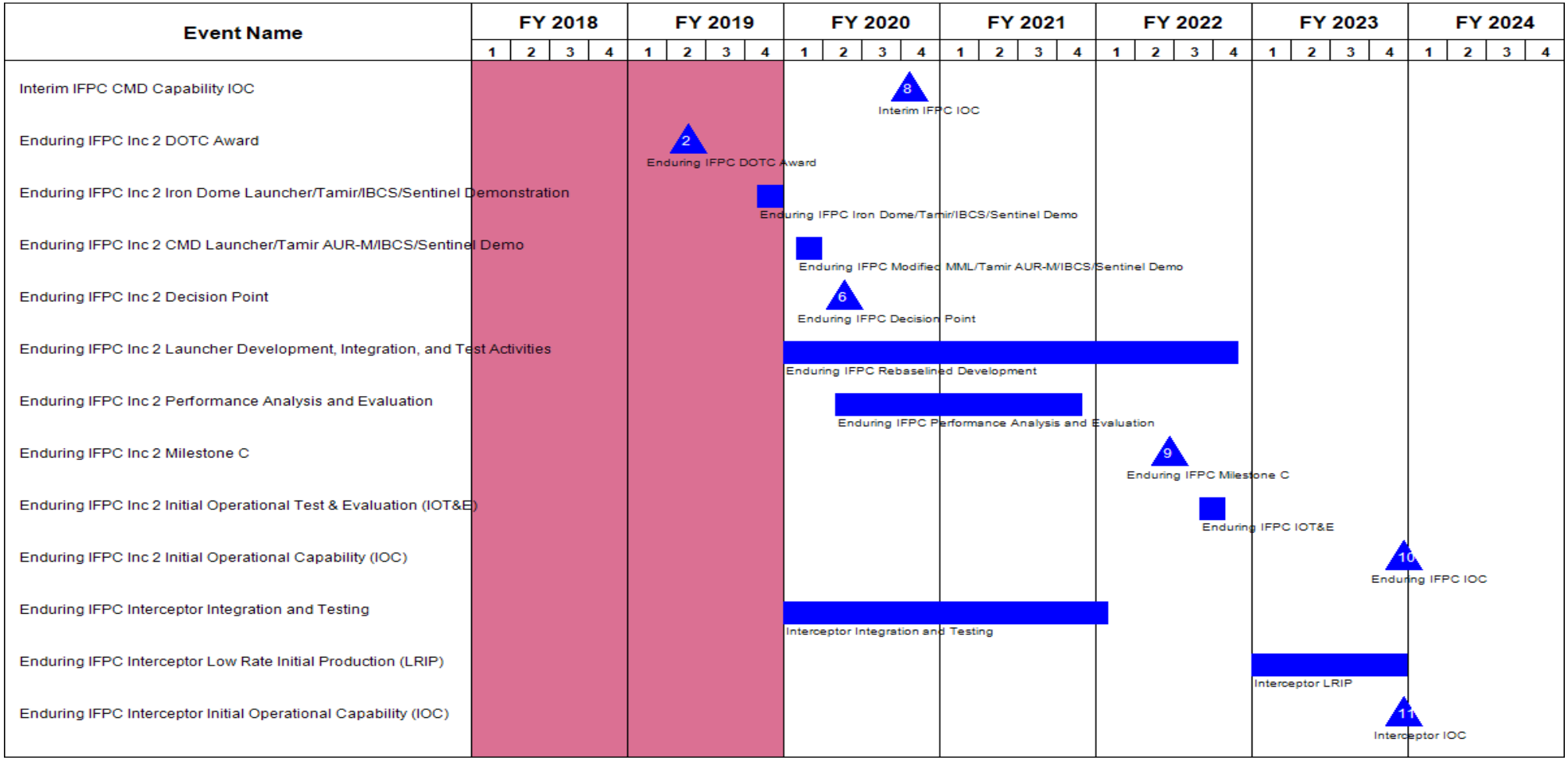

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MML IFPC 3.0 Software Development and Testing	2	2017	4	2018
MML System Integration Lab SW Integration	2	2017	4	2018
MML IFPC Test Asset Manufacturing and Assembly	4	2017	4	2018
MML IFPC Component Qualification Testing	4	2017	4	2018
MML System Integration Lab MML Integration	3	2018	4	2018
Revised Acquisition Strategy Review/Analysis/Decision	3	2018	4	2018
National Defense Authorization Act for FY2019 directed IFPC Report to Congress	1	2019	1	2019
Interim IFPC Directed Requirement - Interim CMD System	2	2019	2	2019
Interim IFPC Title 10, Para 2373 Contract Award for 2 Interim Iron Dome Btrys	3	2019	3	2019
Interim IFPC CMD Capability Integration and Test Activities	2	2019	3	2020
Interim IFPC 1st Iron Dome Battery Delivery to support Testing	1	2020	1	2020
Interim IFPC Safety Confirmation/Performance/Capabilities & Limitations Testing	1	2020	3	2020
Interim IFPC 2nd Iron Dome Battery Delivery to support New Equipment Training	3	2020	3	2020
Interim IFPC CMD Capability IOC	4	2020	4	2020
Enduring IFPC Inc 2 DOTC Award	2	2019	2	2019
Enduring IFPC Inc 2 Iron Dome Launcher/Tamir/IBCS/Sentinel Demonstration	4	2019	4	2019
Enduring IFPC Inc 2 CMD Launcher/Tamir AUR-M/IBCS/Sentinel Demo	1	2020	1	2020
Enduring IFPC Inc 2 Decision Point	2	2020	2	2020
Enduring IFPC Inc 2 Launcher Development, Integration, and Test Activities	1	2020	4	2022
Enduring IFPC Inc 2 Performance Analysis and Evaluation	2	2020	4	2021
Enduring IFPC Inc 2 Milestone C	2	2022	2	2022
Enduring IFPC Inc 2 Initial Operational Test & Evaluation (IOT&E)	3	2022	4	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605052A / *Indirect Fire Protection Capability Inc 2 - Block 1*	**Project (Number/Name)** EY7 / *IFPC Increment 2 - Block 1*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Enduring IFPC Inc 2 Initial Operational Capability (IOC)	4	2023	4	2023
Enduring IFPC Interceptor Integration and Testing	1	2020	1	2022
Enduring IFPC Interceptor Low Rate Initial Production (LRIP)	1	2023	4	2023
Enduring IFPC Interceptor Initial Operational Capability (IOC)	4	2023	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
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*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	60.530	71.435	41.308	-	41.308	25.872	18.081	11.647	12.320	0.000	241.193
FB2: *Man Transportable Robotic System (MTRS) Inc II*	-	8.871	4.299	4.646	-	4.646	0.000	0.000	0.000	0.000	0.000	17.816
FB3: *Robotics Architecture*	-	1.930	1.851	2.876	-	2.876	3.902	4.952	4.989	6.196	0.000	26.696
FB4: *Common Robotic Systems*	-	22.569	29.301	7.796	-	7.796	2.354	0.000	0.000	0.000	0.000	62.020
FB6: *Squad Multipurpose Equipment Transport (SMET)*	-	16.130	11.125	17.804	-	17.804	18.407	11.896	5.400	4.841	0.000	85.603
FB7: *Robotics Enhanced Program (REP)*	-	7.683	9.387	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.070
FB8: *Soldier Borne Sensor (SBS)*	-	2.197	3.465	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.662
FB9: *MTRS Standardization*	-	1.150	9.043	7.000	-	7.000	0.000	0.000	0.000	0.000	0.000	17.193
FG8: *Common Robotic Controller*	-	0.000	2.964	1.186	-	1.186	1.209	1.233	1.258	1.283	0.000	9.133

A. Mission Description and Budget Item Justification

This Program Element supports modernization of the current Ground Robotic fleets by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Robotic Architecture, autonomous operations and other emerging technologies. Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

FB2: The Man Transportable Robotic System (MTRS) Inc. II is the Army's Soldier transportable, remotely operated, medium size (<= 164 lbs.) common robotic system. The system utilizes both radio and tethered communications allowing dismounted Soldiers to perform hazardous missions from a safe standoff distance. The MTRS Inc. II system consists of an operator control unit (OCU), a suite of various mission payloads, and a mobility platform. Open architecture and the Ground Robotic Autonomous Systems (RAS) Interoperability Profile (IOP) requirements are employed to reduce obsolescence risks and to maximize efficiency in acquiring future capabilities. 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 2020 RDTE funds in the amount of $4.646 million will enable the MTRS Inc. II program to progress through Low Rate Initial Production (LRIP) and into Full Rate Production (FRP). Major FY 2020 activities planned include: Delta Production Qualification Testing asset modifications, test support, Engineering Change Proposals (ECPs) (i.e. Payload development, Universal Robotic Controller (URC), etc.), logistic product development, logistic product demonstration and verification, provisioning, development of final Multimedia (TM), and Virtual Clearance Training Suite (VCTS) integration.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605053A *I Ground Robotics*

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 interfaces, common software and common architecture for robotics & autonomous platforms, payloads & universal controllers. It will establish a Common Specifications Reference (CSR) to provide a repository codifying the Army Robotic Autonomous Systems (RAS) standards for open architecture, interoperability interfaces, and common control. RA includes the construction of program specific Interoperability Profiles (IOP) (i.e. Squad Multipurpose Equipment Transport (SMET), Tactical Wheeled Vehicle-Leader Follower (TWV-LF), Route Clearance Interrogation System Type I (RCIS Type I), Common Robotics System (Vehicle) (CRS(V)), Common Robotics System (Individual) (CRS(I)) Inc. II, Common Robotics System (Heavy) (CRS(H)), Enhanced Robotic Payload (ERP), Light Reconnaissance Robot (LRR), Optionally Manned Fighting Vehicle (OMFV), Robotic Combat (RCV), etc.), new standards addressing emerging requirements and Modular Mission Payloads (MMP) (i.e. Cyber Security, new autonomous behaviors & artificial intelligence, new payloads, lethality, etc.).

FY 2020 RDTE funds in the amount of $2.876 million supports the initial scoping & development of the Robotics and Autonomous Systems, Ground (RAS-G) Interoperability Profile (IOP) Version 5.0. IOP V5.0 will provide the required modular open interfaces and compliance test tools for new programs including SMET Modular Mission Payloads (MMPs), LRR, TWV-LF, OMFV, RCV and ERP. Additionally, FY 2020 RDTE funds will support the development & hardening of Robotic Operating System, Military (ROS-M) software modules and ROS-M instantiation documents, and management of ROS-M registry & repository infrastructure.

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 Robotic Controller (URC), a suite of various payloads, and an open architecture common mobility platform allowing for future capability growth. The CRS(I) will allow the operator to 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 2020 RDTE funding in the amount of $7.796 million will complete execution of Production Qualification Test (PQT) activities in accordance with approved Test and Evaluation Master Plan (TEMP). This funding will also fund design updates from test, software updates, Engineering Change Proposals (ECPs), payload development, the development and verification of Operator Technical Manuals (TM), LOG Demo, development of training packages, execution of a Limited User Test (LUT) to support Conditional Materiel Release in 2QFY20, potential delta follow-on testing on unmet CDD thresholds, begin development of Maintainer Technical Manuals and other LOG products needed for Full Materiel Release (FMR) in 4QFY21. This funding also supports programmatic risk mitigation activities including, but not limited to: Cyber Security Controls (i.e. Risk Management Framework), commonality directives, payloads, sensors, condition based maintenance, electronics, standard interfaces and architectures, autonomous operations, and other emerging technologies, interoperability (IOP), and analysis of collaborative operations with various Unmanned Systems assigned at Battalion and below in addition to any program management support costs associated with these activities.

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

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605053A *I Ground Robotics*

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 Modular Mission Payloads (MMP).

FY 2020 RDTE funding in the amount of $17.804 million supports the development integration of Technical Insertions and Modular Mission Payloads (MMP) to increase mission capabilities for Army wide stakeholders to include MEDCOM, MCOE, MSCOE, and CBRNE to meet requirements in the CDD. FY 2020 RDTE funding supports Developmental testing at Aberdeen and other remaining testing required for the Program of Record to include cyber testing and air drop certification. Program support to include salaries, travel and miscellaneous expense for the SMET program will also be funded.

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 will inform emerging capabilities and requirements documents in support of a return on investment to support future Army decision making.

The REP program does not have any FY 2020 RDTE funding.

FB8: The Soldier Borne Sensor (SBS) is a small unmanned aerial vehicle. The 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 system is simple to deploy and use 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. Funding in this project aligns with Army's priorities in support of the National Defense Strategy.

In FY20, this project and funding will transition to PE: 06044827A / Soldier Systems - Warrior Dem/Val project 0604827A.FK4.

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.

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) units.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605053A *I Ground Robotics*

FY 2020 RDTE funds in the amount of $7.000 million will enable the CRS(H) program to complete the following: System Engineering, Program Management, design and test support, refurbishment of test assets from Fly-off #2, development, integration and testing of system-enhancing payloads (eg: dual arm manipulation, autonomy, mapping, etc.), contract data procurement, travel, and other expenses related to the CRS(H) RDTE program.

FG8: The Universal Robotic Controller (URC) 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 (OCUs) for each system. A controlled UxS may be mobile or stationary, can be smart learning, and self-adaptive. Two URCs 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 URC 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 intent of this requirement is allow the Soldier at battalion and below to use the URC to operate unmanned aerial systems (e.g. Raven, PUMA, Short Range Micro (SRM), etc.) and unmanned ground vehicles (e.g. CRS(I), CRS(V),CRS(H), SMET, MTRS INC II, Light Reconnaissance (LR), Wingman, etc.) and emerging unmanned air/ground systems. The URC is defined in the Common Robotic System (Individual) (CRS(I)) Capability Development Document (CDD) and is included in the CRS(I) acquisition. A standalone requirements document is being developed at a date TBD.

FY 2020 RDTE funding in the amount of $1.186 million will be utilized to complete test evaluation and Log product development under the CRS(I) contract, mature the Universal Robotic Controller to meet the requirements in the CDD and emerging programs of record, controller software updates, and integration and test the URC into other Unmanned Ground Vehicles (UGV) or Unmanned Aerial Vehicles (UAS) programs of record via an Engineering Change Proposal (ECP). This funding also supports programmatic risk mitigation activities including, but not limited to: Cyber Security Controls (i.e. Risk Management Framework), commonality directives, payloads, sensors, condition based maintenance, electronics, standard interfaces and architectures, autonomous operations and other emerging technologies, interoperability (IOP), and analysis of collaborative operations with various Unmanned Systems assigned at Battalion and below in addition to any program management support costs associated with these activities.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	70.760	86.167	92.181	-	92.181
Current President's Budget	60.530	71.435	41.308	-	41.308
Total Adjustments	-10.230	-14.732	-50.873	-	-50.873
• Congressional General Reductions	-0.050	-0.088			
• Congressional Directed Reductions	-7.750	-14.644			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.430	-			
• Adjustments to Budget Years	-	-	-50.873	-	-50.873

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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*

Change Summary Explanation

The decrease in funding from FY 2019 to FY 2020 is due to two projects (Robotics Enhanced Program (FB7) and Soldier Borne Sensor (FB8)) being zeroed out starting in FY 2020.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
FB2: *Man Transportable Robotic System (MTRS) Inc II*	-	8.871	4.299	4.646	-	4.646	0.000	0.000	0.000	0.000	0.000	17.816
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Man Transportable Robotic System (MTRS) Inc. II is the Army's Soldier transportable, remotely operated, medium size (<= 164 lbs.) common robotic system. The system utilizes both radio and tethered communications allowing dismounted Soldiers to perform hazardous missions from a safe standoff distance. The MTRS Inc. II system consists of an operator control unit (OCU), a suite of various mission payloads, and a mobility platform. Open architecture and the Ground Robotic Autonomous Systems (RAS) Interoperability Profile (IOP) requirements are employed to reduce obsolescence risks and to maximize efficiency in acquiring future capabilities. 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 2020 RDTE funds will enable the MTRS Inc. II program to progress through Low Rate Initial Production (LRIP) and into Full Rate Production (FRP). Major FY 2020 activities planned include: Delta Production Qualification Testing asset modifications, test support, Engineering Change Proposals (ECPs) (i.e. Payload development, Universal Robotic Controller, etc.), logistic product development, logistic product demonstration and verification, provisioning, development of final Multimedia (TM), and Virtual Clearance Training Suite (VCTS) integration.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: MTRS Inc II RDTE	0.384	0.655	-
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 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 2019 to FY 2020 Increase/Decrease Statement: The efforts listed below are in support of continued developmental efforts for the MTRS Inc. II program.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 to FY2020 funding levels remain consistent for the MTRS Inc II program. Efforts once grouped together in FY 2019 Accomplishments/Planned Programs are broken out in FY 2020 for increased transparency.			
Title: MTRS Inc II RDTE - Engineering Change Proposals ***Description:*** MTRS Inc. II RDTE funding to support Government initiated Engineering Change Proposals (ECP) to the MTRS Inc. II system. ***FY 2020 Plans:*** Funding to support engineering, testing, logistics, etc. activities to support MTRS Inc. II ECP efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.	-	-	0.400
Title: MTRS Inc II RDTE - IPT Matrix Support Salary ***Description:*** MTRS Inc. II RDTE funding to support engineering and various test efforts to include redesign of test articles, delta PQT test execution, software, engineering test support staff salaries, and System Engineering Program Management (SEPM) costs. ***FY 2019 Plans:*** Funding is for program management support for salaries, travel, and miscellaneous expenses related to the MTRS Inc. II program ***FY 2020 Plans:*** Funding to support engineering activities, test article redesign, testing and salaries for IPT and program management costs to include travel and miscellaneous expenses associated with the MTRS Inc. II RDTE efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.	1.337	0.660	0.746
Title: MTRS Inc II RDTE ? TARDEC Multi-Robot Operator Controll Unit (MOCU) Software Support ***Description:*** MTRS Inc. II RDTE funding to support the following TARDEC services to include software subject matter expert support, testing support, issue remediation, and transitioning MOCU software lead to TARDEC SEC as the software sustainment agency. ***FY 2019 Plans:*** Funding is for TARDEC MOCU software support ***FY 2020 Plans:***	0.736	1.073	0.900

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Funding to support TARDEC SW and engineering activities to include travel and miscellaneous expenses associated with the MTRS Inc. II RDTE efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.			
Title: MTRS Inc II RDTE ? SPAWAR Multi-Robot Operator Control Unit (MOCU) 3 SW Support ***Description:*** MTRS Inc. II RDTE funding to provide subject matter expert support, software updates, incremental software drops for integration and testing, software test simulator, software drop test reports, debugging and issue remediation, and the transition of MOCU software to TARDEC for long term sustainment. ***FY 2019 Plans:*** Funding is for SPAWAR MOCU 3 software support. ***FY 2020 Plans:*** Funding to support SPAWAR MOCU 3.0 SW and engineering activities to include travel and miscellaneous expenses associated with the MTRS Inc. II RDTE efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.	0.772	1.200	0.700
Title: MTRS Inc II RDTE - Virtual Clearance Training Suite (VCTS) ***Description:*** MTRS Inc. II RDTE funding to support the development activities to incorporate MTRS Inc. II into the Virtual Clearance Training Suite. ***FY 2020 Plans:*** Funding to support simulator suite development and program management costs to include travel and miscellaneous expenses associated with the MTRS Inc. II RDTE efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.	-	-	1.000
Title: MTRS Inc II RDTE - Endeavor Logistic Product development, demonstration and verification ***Description:*** MTRS Inc. II RDTE funding to support the development of a MTRS Inc. II logistic products, demonstration and verification. ***FY 2020 Plans:***	4.833	-	0.500

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Funding to support logistic activities and program management costs to include travel and miscellaneous expenses associated with the MTRS Inc. II RDTE efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.			
Title: MTRS Inc II RDTE - Testing ***Description:*** MTRS Inc. II delta Production Qualification Testing (PQT). ***FY 2019 Plans:*** Funding if for various entities for MTRS Inc. II test efforts ***FY 2020 Plans:*** MTRS Inc. II delta Production Qualification Testing (PQT) to include reliability and performance testing. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.	0.809	0.554	0.400
Title: FY 2019 SBIR / STTR Transfer ***Description:*** FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** SBIR/STTR ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Adjusted for FY 2019 SBIR / STTR Transfer	-	0.157	-
Accomplishments/Planned Programs Subtotals	8.871	4.299	4.646

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• R67050: *Man Transportable Robotic Sys Inc II (MTRS Inc II)*	-	6.615	36.254	-	36.254	64.043	57.979	2.213	-	0.000	167.104

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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*

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 contract is 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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Costs	MIPR	VARIOUS : MULTIPLE	-	1.721	Oct 2017	1.210	Nov 2018	0.746	Nov 2019	-		0.746	0.000	3.677	-
		Subtotal	-	1.721		1.210		0.746		-		0.746	0.000	3.677	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test Hardware	SS/FFP	Endeavor : Chelmsford, MA	-	1.977	Dec 2017	0.105	Apr 2019	-		-		-	0.000	2.082	-
Virtual Clearance Training Suite (VCTS)	Various	Various : Multiple	-	-		-		1.000	Oct 2019	-		1.000	0.000	1.000	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.157	Oct 2018	-		-		-	0.000	0.157	-
		Subtotal	-	1.977		0.262		1.000		-		1.000	0.000	3.239	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MTRS Inc II MOCU development	Various	Various : Multiple	-	1.508	Jun 2018	2.273	Jan 2019	1.600	Oct 2019	-		1.600	0.000	5.381	-
MTRS Inc II contract data	SS/FFP	Endeavor : Chelmsford, MA	-	2.786	Dec 2017	-		0.500	Oct 2019	-		0.500	0.000	3.286	-
MTRS In II Engineering Change Proposals	TBD	TBD : TBD	-	-		-		0.400	Oct 2019	-		0.400	0.000	0.400	-
		Subtotal	-	4.294		2.273		2.500		-		2.500	0.000	9.067	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test site and test site support for FAT	MIPR	VARIOUS : MULTIPLE	-	0.879	Jan 2019	0.554	Dec 2018	0.400	Oct 2019	-		0.400	0.000	1.833	-
		Subtotal	-	0.879		0.554		0.400		-		0.400	0.000	1.833	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	8.871		4.299		4.646		-		4.646	0.000	17.816	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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*

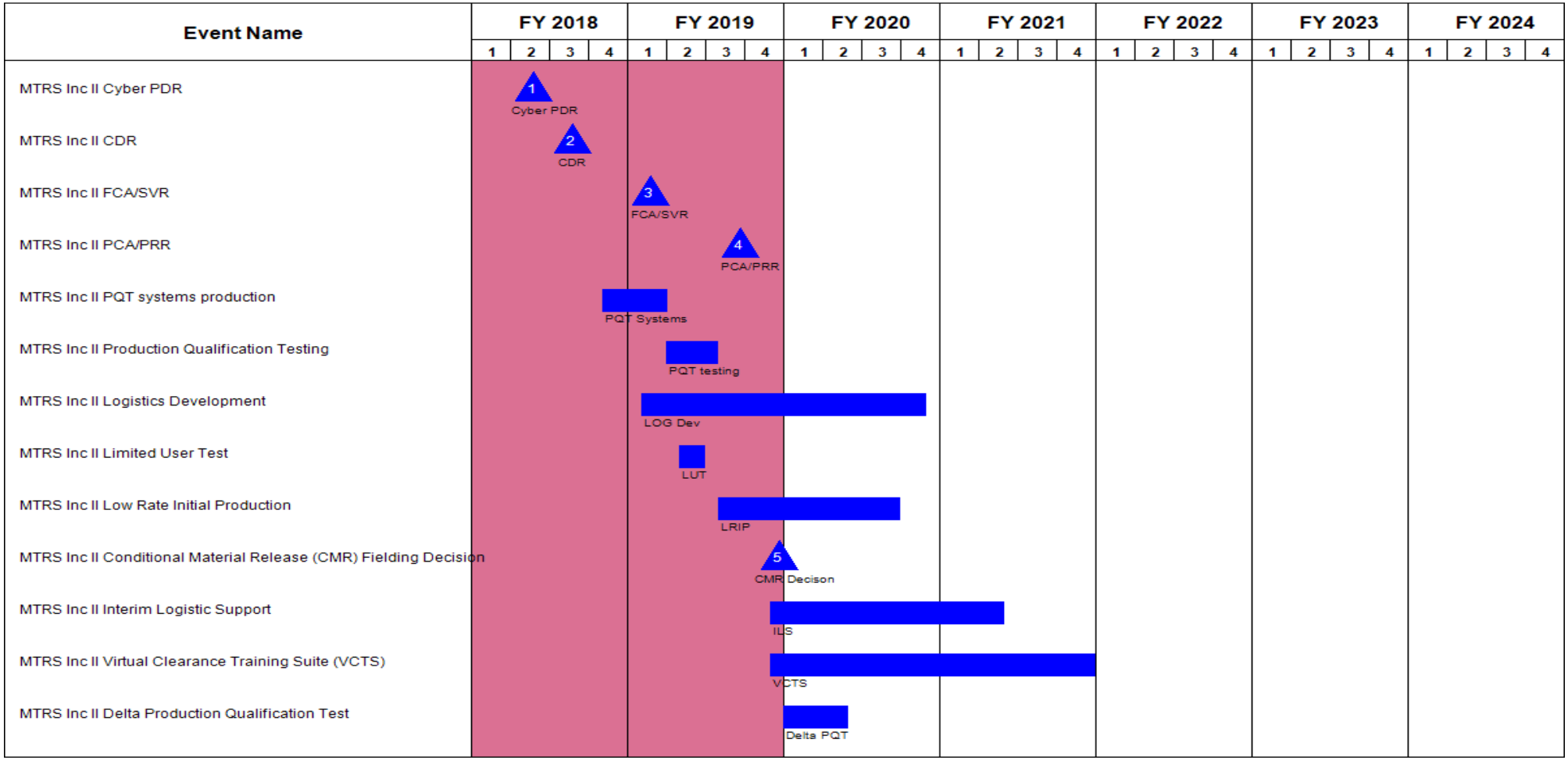

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB2 / *Man Transportable Robotic System (MTRS) Inc II*

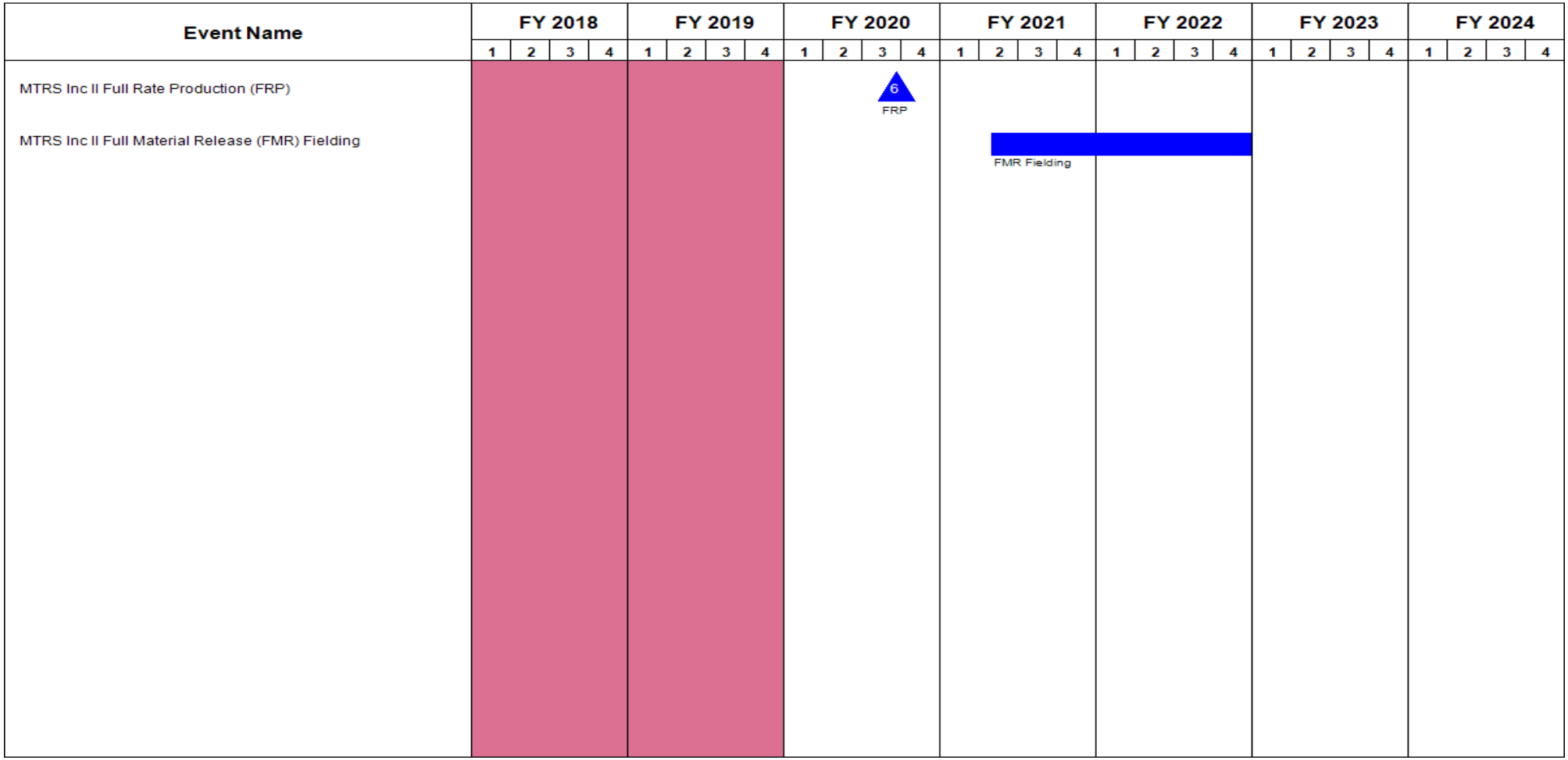

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB2 / *Man Transportable Robotic System (MTRS) Inc II*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
MTRS Inc II Cyber PDR	2	2018	2	2018
MTRS Inc II CDR	3	2018	3	2018
MTRS Inc II FCA/SVR	1	2019	1	2019
MTRS Inc II PCA/PRR	3	2019	3	2019
MTRS Inc II PQT systems production	4	2018	1	2019
MTRS Inc II Production Qualification Testing	2	2019	3	2019
MTRS Inc II Logistics Development	1	2019	4	2020
MTRS Inc II Limited User Test	2	2019	2	2019
MTRS Inc II Low Rate Initial Production	3	2019	3	2020
MTRS Inc II Conditional Material Release (CMR) Fielding Decision	4	2019	4	2019
MTRS Inc II Interim Logistic Support	4	2019	2	2021
MTRS Inc II Virtual Clearance Training Suite (VCTS)	4	2019	4	2021
MTRS Inc II Delta Production Qualification Test	1	2020	2	2020
MTRS Inc II Full Rate Production (FRP)	3	2020	3	2020
MTRS Inc II Full Material Release (FMR) Fielding	2	2021	4	2022

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB3 / *Robotics Architecture*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
FB3: *Robotics Architecture*	-	1.930	1.851	2.876	-	2.876	3.902	4.952	4.989	6.196	0.000	26.696
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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 interfaces, common software and common architecture for robotics & autonomous platforms, payloads & universal controllers. It will establish a Common Specifications Reference (CSR) to provide a repository codifying the Army Robotic Autonomous Systems (RAS) standards for open architecture, interoperability interfaces, and common control. RA includes the construction of program specific Interoperability Profiles (IOP) (i.e. Squad Multipurpose Equipment Transport (SMET), Tactical Wheeled Vehicle-Leader Follower (TWV-LF), Route Clearance Interrogation System Type I (RCIS Type I), Common Robotics System (Vehicle) (CRS(V)), Common Robotics System (Individual) (CRS(I)) Inc. II, Common Robotics System (Heavy) (CRS(H)), Enhanced Robotic Payload (ERP), Light Reconnaissance Robot (LRR), Optionally Manned Fighting Vehicle (OMFV), Robotic Combat (RCV), etc.), new standards addressing emerging requirements and Modular Mission Payloads (MMP) (i.e. Cyber Security, new autonomous behaviors & artificial intelligence, new payloads, lethality, etc.).

FY 2020 RDTE funds in the amount of $1.792 million support the initial scoping & development of the Robotics and Autonomous Systems, Ground (RAS-G) Interoperability Profile (IOP) Version 5.0. IOP V5.0 will provide the required modular open interfaces and compliance test tools for new programs including SMET Modular Mission Payloads (MMPs), LRR, TWV-LF, OMFV, RCV and ERP. Additionally, FY 2020 RDTE funds will support the development & hardening of Robotic Operating System, Military (ROS-M) software modules and ROS-M instantiation documents, and management of ROS-M registry & repository infrastructure.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Robotics Architecture	1.930	1.792	2.876
Description: Provide architecture tools and support for current Programs of Record (PoR) & new requirements to allow for interoperability within the Joint community for Robotics & Autonomous Systems.			
FY 2019 Plans: 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.			
FY 2020 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2020 funding for Robotics Architecture will develop & apply Interoperability (IOP) & ROS-M artifacts and Conformance Validation Tools for programs of record including the Squad Multipurpose Equipment Transport (SMET), SMET Modular Mission Payloads (MMPs), Tactical Wheeled Vehicle-Leader Follower (TWV-LF), Route Clearance Interrogation System Type I (RCIS Type I), Common Robotics System (Vehicle) (CRS(V)), Common Robotics System (Individual) (CRS(I)) Inc. II, Common Robotics System (Heavy) (CRS(H)), Enhanced Robotic Payload (ERP), Light Reconnaissance Robot (LRR), Optionally Manned Fighting Vehicle (OMFV), Optionally Manned Tank (OMT), and Robotic Combat (RCV). It will develop and update IOP and tools to evaluate and assess the RCIS Type I, SMET MMPs, LRR, and Enhanced Robotics Payloads (ERP) and refine tools for TWV-LF, CRS(I), MTRS Inc. II & SMET. It will establish a Common Specifications Reference (CSR) to provide a repository codifying the Army RAS standards for open architecture, interoperability interfaces, and common control. It will initiate the development of IOP V5 which will provide interfaces for near term emerging programs such as key SMET MMPs & ERP payloads, CRS(V), LRR, RCV, and Autonomous Convoy Operations. Additionally, FY2020 RDTE funds will support the development & hardening of Robotic Operating System, Military (ROS-M) software modules and ROS-M instantiation documents, and management of ROS-M registry & repository infrastructure. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase in funding from FY 2019 to FY 2020 is for Robotic Operating System - Military (ROS-M) artifacts/module development and larger focus on stress testing of IOP and ROS-M artifacts.			
Title: FY 2019 SBIR / STTR Transfer ***Description:*** SBIR/STTR ***FY 2019 Plans:*** SBIR/STTR ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Adjust for FY 2019 SBIR / STTR Transfer	-	0.059	-
Accomplishments/Planned Programs Subtotals	1.930	1.851	2.876

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

In FY 2020 the Robotics Architecture line funds supporting matrix personnel & related contracts to develop IOP & ROS-M 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 provide enterprise wide efficiencies and are central to the Army's acquisition

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philosophy of a modular open systems approach between the major subsystems of robotics and autonomous systems, as described throughout the Army approved Robotic Autonomous Systems (RAS) Initial Capabilities Document (ICD).

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	Various : Multiple	-	0.766	Dec 2017	0.925	Nov 2018	0.130	Oct 2019	-		0.130	0.000	1.821	-
		Subtotal	-	0.766		0.925		0.130		-		0.130	0.000	1.821	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
IOP V4	Various	Various : Multiple	-	0.914	May 2018	0.617	May 2019	-		-		-	0.000	1.531	-
Instantiation Tool Development	SS/CPFF	DCS : Warren, MI	-	-		-		0.100	Jun 2020	-		0.100	0.000	0.100	-
Conformance Verification Testing (CVT) Update	MIPR	TARDEC : Warren, MI	-	-		-		0.300	Apr 2020	-		0.300	0.000	0.300	-
IOP V5 Development	Various	Various : Multiple	-	-		-		1.070	Jan 2020	-		1.070	0.000	1.070	-
Robotic Operating System - Military (ROS-M)	Various	Various : Multiple	-	-		-		0.800	Apr 2020	-		0.800	0.000	0.800	-
IOP V4 Radio Interfaces Development	MIPR	NAVSEA : Washington D.C.	-	0.250	Sep 2018	0.250	Jun 2019	-		-		-	0.000	0.500	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.059	Oct 2018	-		-		-	0.000	0.059	-
		Subtotal	-	1.164		0.926		2.270		-		2.270	0.000	4.360	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Conformance Verification Testing (CVT) Maintenance	MIPR	TARDEC : Warren, MI	-	-		-		0.126	Jan 2020	-		0.126	0.000	0.126	-
Robotic Operating System - Military (ROS-M) Infrastructure Management	MIPR	TARDEC : Warren, MI	-	-		-		0.150		-		0.150	0.000	0.150	-
		Subtotal	-	-		-		0.276		-		0.276	0.000	0.276	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
New IOP & ROS-M Artifacts Stress Testing	MIPR	TARDEC : Warren, MI	-	-		-		0.200	Apr 2020	-		0.200	0.000	0.200	-
		Subtotal	-	-		-		0.200		-		0.200	0.000	0.200	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	1.930		1.851		2.876		-		2.876	0.000	6.657	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

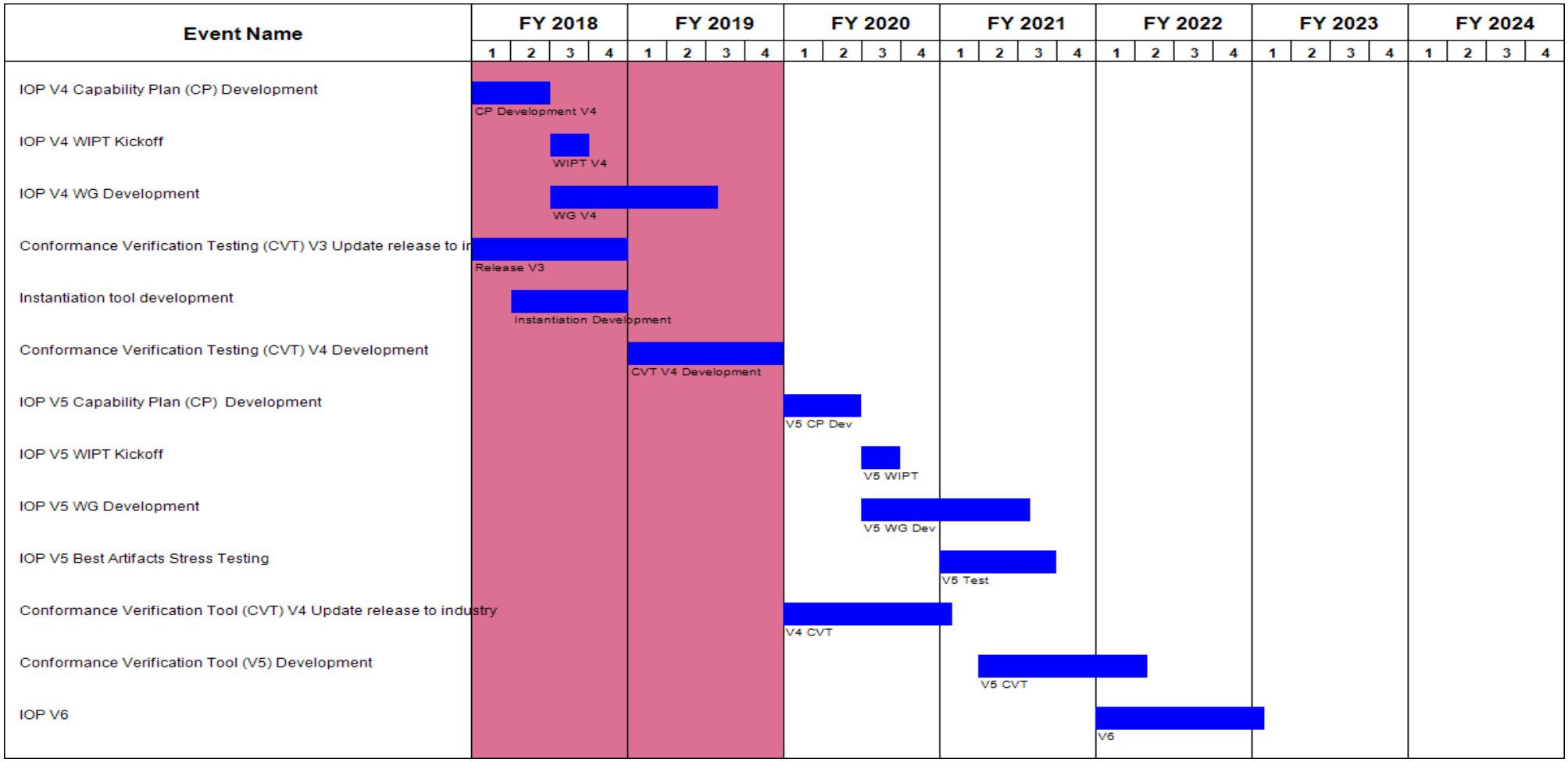

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

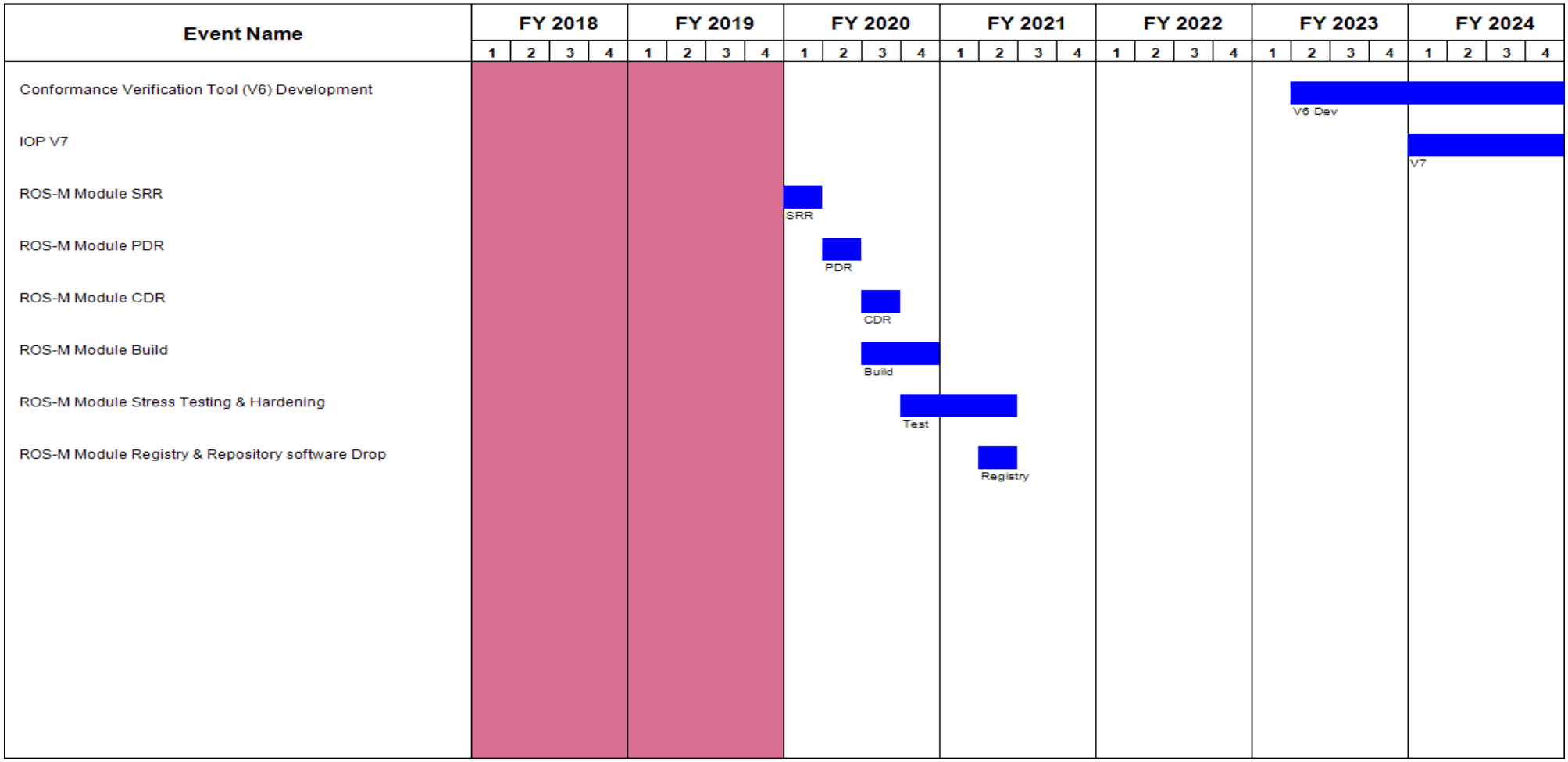

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB3 / *Robotics Architecture*

Schedule Details

	Start		End	
Events	**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 Capability Plan (CP) Development	1	2020	2	2020
IOP V5 WIPT Kickoff	3	2020	3	2020
IOP V5 WG Development	3	2020	3	2021
IOP V5 Best Artifacts Stress Testing	1	2021	3	2021
Conformance Verification Tool (CVT) V4 Update release to industry	1	2020	1	2021
Conformance Verification Tool (V5) Development	2	2021	2	2022
IOP V6	1	2022	1	2023
Conformance Verification Tool (V6) Development	2	2023	1	2025
IOP V7	1	2024	4	2024
ROS-M Module SRR	1	2020	1	2020
ROS-M Module PDR	2	2020	2	2020
ROS-M Module CDR	3	2020	3	2020
ROS-M Module Build	3	2020	4	2020
ROS-M Module Stress Testing & Hardening	4	2020	2	2021
ROS-M Module Registry & Repository software Drop	2	2021	2	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
FB4: *Common Robotic Systems*	-	22.569	29.301	7.796	-	7.796	2.354	0.000	0.000	0.000	0.000	62.020
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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 Robotic Controller (URC), a suite of various payloads, and an open architecture common mobility platform allowing for future capability growth. The CRS(I) will allow the operator to 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 2020 RDTE funding in the amount of $7.796 million will complete execution of Production Qualification Test (PQT) activities in accordance with approved Test and Evaluation Master Plan (TEMP). This funding will also fund design updates from test, software updates, Engineering Change Proposals (ECPs), payload development, the development and verification of Operator Technical Manuals (TM), LOG Demo, development of training packages, execution of a Limited User Test (LUT) to support Conditional Materiel Release in 2QFY20, potential delta follow-on testing on unmet CDD thresholds, begin development of Maintainer Technical Manuals and other LOG products needed for Full Materiel Release (FMR) in 4QFY21. This funding also supports programmatic risk mitigation activities including, but not limited to: Cyber Security Controls (i.e. Risk Management Framework), commonality directives, payloads, sensors, condition based maintenance, electronics, standard interfaces and architectures, autonomous operations, and other emerging technologies, interoperability (IOP), and analysis of collaborative operations with various Unmanned Systems assigned at Battalion and below in addition to any program management support costs associated with these activities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: CRS(I) Engineering Manufacturing Design (EMD)	18.930	5.546	-
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 2019 Plans: 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.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
The efforts listed below are in support of continued developmental efforts for the CRS(I) program. FY 2019 to FY2020 funding levels for the CRS(I) program are decreasing as developmental efforts draw down and Milestone C is scheduled for FY 2019. Efforts once grouped together in FY 2019 Accomplishments/Planned Programs are broken out in FY 2020 for increased transparency.			
Title: CRS(I) Contractor support to test and design updates ***Description:*** CRS(I) contractor to provide support to Production Qualification Test (PQT) and Limited User Test (LUT) and make critical design fixes. ***FY 2019 Plans:*** need to enter description ***FY 2020 Plans:*** Funding for contractor to provide direct onsite support to PQT and LUT and well as provide reach back Engineering support to troubleshoot systems under test and make design updates for critical issues found in test. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.	-	0.653	1.400
Title: CRS(I) PQT and LUT execution ***Description:*** ATEC costs to execute Production Qualification Test (PQT) and Limited User Test (LUT). ***FY 2019 Plans:*** need to enter description ***FY 2020 Plans:*** Funding for ATEC to execute PQT and LUT in accordance with program TEMP. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.	0.115	9.202	2.400
Title: CRS(I) Log manuals ***Description:*** CRS(I) RDTE funding for contractor to develop Technical Manuals. ***FY 2019 Plans:*** need to enter description ***FY 2020 Plans:***	-	4.184	1.700

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Funding for the development and verification of Technical Manuals (TM), LOG Demo, development of training packages to support CRS(I) PQT and LUT to support Conditional Materiel Release (CMR) and towards Full Materiel Release (FMR). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.			
Title: CRS(I) TARDEC Software Support ***Description:*** CRS(I) RDTE funding to support the following TARDEC services to include software subject matter expert support, testing support, issue remediation, and transitioning Multi-robot Operator Control Unit (MOCU) software lead to TARDEC SEC as the software sustainment agency. ***FY 2019 Plans:*** need to enter description ***FY 2020 Plans:*** Funding to support TARDEC software and engineering activities to include travel and miscellaneous expenses associated with the CRS(I) RDTE efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.	0.862	3.250	0.900
Title: CRS(I) IPT Matrix Support Salary ***Description:*** CRS(I) RDTE funding to support engineering and various test efforts to include redesign of test articles, delta PQT test execution, and software, engineering test support staff salaries, and System Engineering Program Management (SEPM) costs. ***FY 2019 Plans:*** need to enter description ***FY 2020 Plans:*** Funding to support engineering activities, test article redesign, testing and salaries for IPT and program management costs to include travel and miscellaneous expenses associated with the CRS(I) RDTE efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.	2.662	4.392	0.700
Title: CRS(I) SPAWAR MOCU software support	-	1.000	0.696

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Description: CRS(I) RDTE funding to provide subject matter expert support, software updates, incremental software drops for integration and testing, software test simulator, software drop test reports, debugging and issue remediation, and the transition of Multi-robot Operator Control Unit (MOCU) software to TARDEC for long term sustainment. ***FY 2019 Plans:*** need to enter description ***FY 2020 Plans:*** Funding to support SPAWAR MOCU software and engineering activities to include travel and miscellaneous expenses associated with the MTRS Inc II RDTE efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.			
Title: FY 2019 SBIR / STTR Transfer ***Description:*** SBIR/STTR ***FY 2019 Plans:*** SBIR/STTR ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Adjust for FY 2019 SBIR / STTR Transfer	-	1.074	-
Accomplishments/Planned Programs Subtotals	22.569	29.301	7.796

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• G99595: *Common Robotic System-Individual (CRS-I)*	-	3.161	2.285	-	2.285	3.952	4.135	4.438	4.632	0.000	22.603
• G93696: *Common Robotic System - Individual (CRS-I)*	-	-	30.387	-	30.387	37.981	9.000	-	-	0.000	77.368

Remarks

D. Acquisition Strategy

The CRS(I) acquisition strategy includes awarding a competitive Cost-Plus/Fixed-Fee (CPFF) contract for two contractors to compete in the Engineering and Manufacturing Development (EMD) Phase following Milestone (MS) B (FY 2018) approval. The EMD phase includes a Critical Design Review (CDR) (FY 2018), the

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procurement of Production Qualification Test (PQT) (FY 2019) assets and a "Government Run-Off" to determine which contractor will proceed into the Production and Deployment (P&D) Phase following MS C (FY 2019) approval. P&D includes a Firm-Fixed Price (FFP) option for Low Rate Initial Production (LRIP) (FY 2019), execution of Production Qualification Testing (FY 2019), Safety Release, Limited User Test (LUT), Conditional Material Release (CMR) (FY 2020) development of logistics products, Full Material Release (FMR)(FY 2021) and Full Rate Production (FRP) (FY 2021).

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	MIPR	Combat Support - Combat Service Support : Warren MI	-	2.662	Dec 2017	4.392	Nov 2018	0.700	Oct 2019	-		0.700	0.000	7.754	-
		Subtotal	-	2.662		4.392		0.700		-		0.700	0.000	7.754	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Manufacturing & Design	C/CPFF	tbd : tbd	-	18.930	Mar 2018	5.999	Nov 2018	1.400	Oct 2019	-		1.400	0.000	26.329	-
Government Furnished Equipment	Various	Various : Multiple	-	-		0.200	Sep 2019	-		-		-	0.000	0.200	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		1.074	Oct 2018	-		-		-	0.000	1.074	-
		Subtotal	-	18.930		7.273		1.400		-		1.400	0.000	27.603	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Log manuals	C/CPFF	Multiple : Various	-	-		4.184	May 2019	1.700	Oct 2019	-		1.700	0.000	5.884	-
		Subtotal	-	-		4.184		1.700		-		1.700	0.000	5.884	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Production Qualification Testing (PQT) & Limited User Testing (LUT)	Various	Various : Multiple	-	0.115	Oct 2018	9.202	Jan 2019	2.400	Dec 2019	-		2.400	0.000	11.717	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TARDEC software support	Various	TARDEC : Warren, MI	-	0.862	Mar 2018	3.250	Jan 2019	0.900	Oct 2019	-		0.900	0.000	5.012	-
SPAWAR software support	Various	SPAWAR : San Diego, CA	-	-		1.000	Apr 2019	0.696	Oct 2019	-		0.696	0.000	1.696	-
		Subtotal	-	0.977		13.452		3.996		-		3.996	0.000	18.425	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	22.569		29.301		7.796		-		7.796	0.000	59.666	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB4 / *Common Robotic Systems*

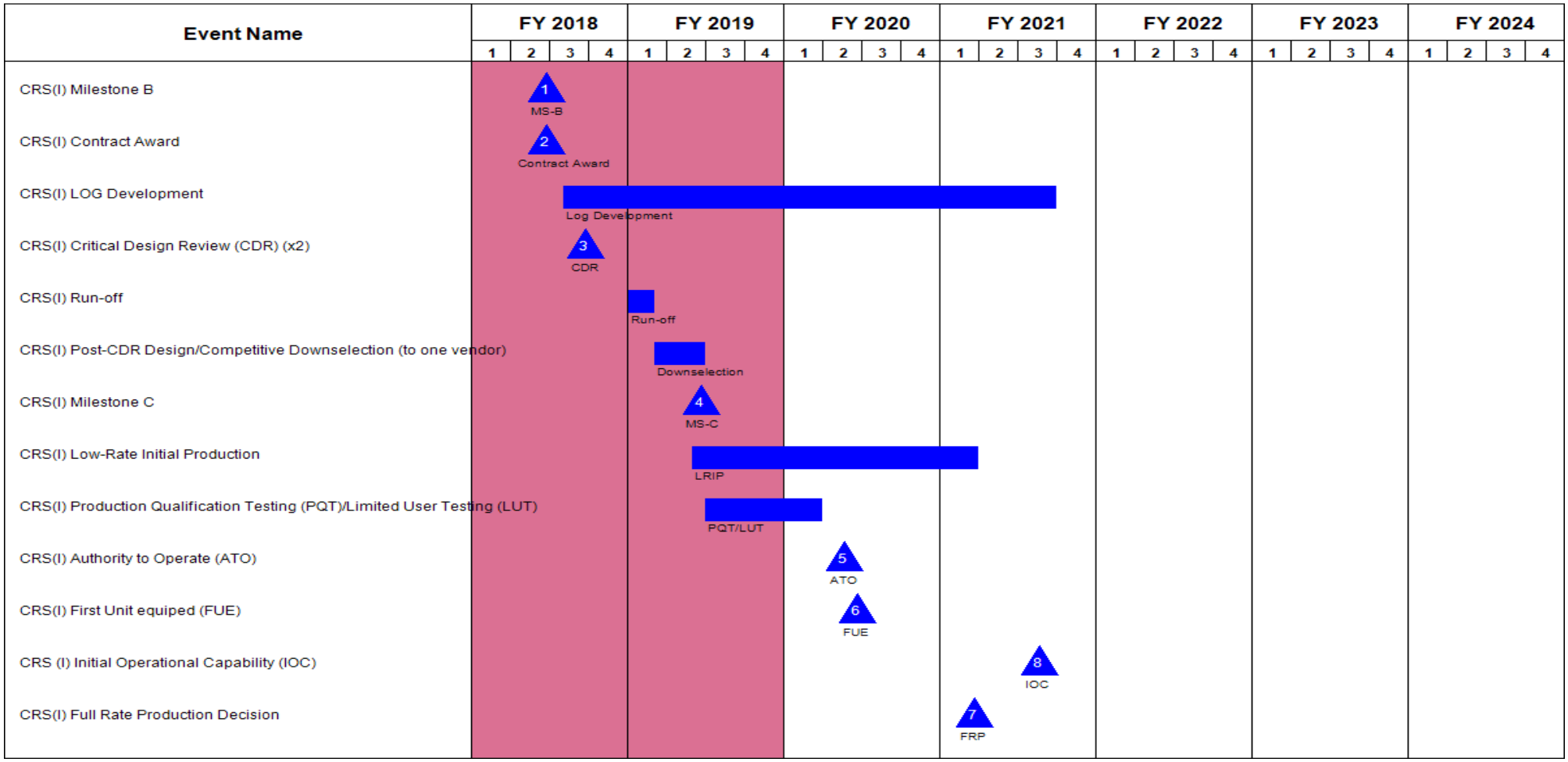

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB4 / *Common Robotic Systems*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
CRS(I) Milestone B	2	2018	2	2018
CRS(I) Contract Award	2	2018	2	2018
CRS(I) LOG Development	3	2018	3	2021
CRS(I) Critical Design Review (CDR) (x2)	3	2018	3	2018
CRS(I) Run-off	1	2019	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	1	2021
CRS(I) Production Qualification Testing (PQT)/Limited User Testing (LUT)	3	2019	1	2020
CRS(I) Authority to Operate (ATO)	2	2020	2	2020
CRS(I) First Unit equiped (FUE)	2	2020	2	2020
CRS (I) Initial Operational Capability (IOC)	3	2021	3	2021
CRS(I) Full Rate Production Decision	1	2021	1	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB6 / *Squad Multipurpose Equipment Transport (SMET)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
FB6: *Squad Multipurpose Equipment Transport (SMET)*	-	16.130	11.125	17.804	-	17.804	18.407	11.896	5.400	4.841	0.000	85.603
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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 reintegration of Modular Mission Payloads (MMP) and technical insertions.

FY 2020 RDTE funding supports the development integration and purchase of Technical Insertions and Modular Mission Payloads (MMP) to increase mission capabilities to meet objective requirements in the CDD. FY 2020 RDTE funding supports Developmental testing at Aberdeen and other remaining testing required for the Program of Record to include cyber testing and air drop certification. Program support to include salaries, travel and miscellaneous expense for the SMET program will also be funded.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: SMET	16.130	10.461	17.804
Description: Squad Multipurpose Equipment Transport (SMET)			
FY 2019 Plans: Funding supports the development and purchase of Technical Insertions, Modular Mission Payloads (MMP) Development, Logistics Support Data, and SMET Program of Record (POR) production contract development to include the Statement of Work (SOW) and Request for Proposal (RFP) under the Phase III Other Transaction Agreement (OTA). FY2019 RDTE funding also supports Developmental testing at Aberdeen and TARDEC and the completion of the Technology Demonstration, Program Management costs to include salaries, travel and miscellaneous expense for the SMET program.			
FY 2020 Plans: FY 2020 RDTE funding supports the development and purchase of Technical Insertions and Modular Mission Payloads (MMP). FY 2020 RDTE funding supports Developmental testing at Aberdeen and other remaining testing required for the Program of Record to include cyber testing and air drop certification. Program support to include salaries, travel and miscellaneous expense for the SMET program will also be funded.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Funding increase due to development of Modular Mission Payload (MMP) and Technical Insertions, remaining Program of Record (POR) testing at Aberdeen Test Center (ATC).			
Title: FY 2019 SBIR/ STTR Transfer	-	0.664	-
FY 2019 Plans: Adjusted for SBIR/STTR Transfer			
FY 2019 to FY 2020 Increase/Decrease Statement: Adjusted for SBIR/STTR Transfer			
Accomplishments/Planned Programs Subtotals	16.130	11.125	17.804

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• R12154: *Squad Multipurpose Equipment Transport (SMET)*	-	-	8.768	-	8.768	20.332	42.964	43.989	46.663	0.000	162.716

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 Phase I Assessment supported a rapid start to establish an Other Transaction Authority (OTA) Acquisition Strategy 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 the OTA Phase II 12 month Technology Demonstration, 20 systems were purchased from each of the 4 vendors issued to IBCTs. This Technology Demonstration will guide the development of the Capability Development Document (CDD) leading to a Army Requirements Oversight Council (AROC) decision in 3QFY19.

Following the OTA Phase II Technology Demonstration, a source selection will occur to award a Program of Record (POR) contract(s) for LRIP and production to the system that best meets the Army's needs. Project Manager Force Projection (PM FP) is requesting authority from the Army Acquisition Executive (AAE) to pursue a Rapid Fielding pathway under Section 804 Middle Tier Acquisition (MTA) in accordance with Fiscal Year (FY) 2016 National Defense Authorization Act (NDAA) to meet Chief of Staff of the Army guidance to provide the Squad Multipurpose Equipment Transport (S-MET) capability to Soldiers by 2QFY20. Under an approved Section 804 Rapid Fielding pathway, the PM will down select to one or more of the four prototypes and award refurbishment of Phase II systems, LRIP, FRP, LOG development and System Technical Support under the Phase III Production OTA.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

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 (IOP) 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 to include future technical insertions and Modular Mission Payloads (MMP) into the Program of Record. Throughout the life of the program, the Army will continue to survey the marketplace to identify opportunities for technology insertions and required Modular Mission Payloads (MMP), relying on competition to drive down costs.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB6 / *Squad Multipurpose Equipment Transport (SMET)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Costs	MIPR	PM FP : Warren, MI	-	1.000		1.461	Oct 2018	2.304	Oct 2019	-		2.304	0.000	4.765	-
		Subtotal	-	1.000		1.461		2.304		-		2.304	0.000	4.765	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Directed Requirement Technology Demonstration	C/FFP	Year Long Excursion : TBD	-	10.328		2.200	Dec 2018	-		-		-	0.000	12.528	-
Technical Insertions	C/FFP	TBD : TBD	-	-		3.000	Nov 2018	3.000	Nov 2019	-		3.000	0.000	6.000	-
Modular Mission Payloads (MMP)	MIPR	Ft Benning : Ft Benning, GA	-	-		0.800	Mar 2019	7.000	Jan 2020	-		7.000	0.000	7.800	-
FY 2019 SBIR/STTR Transfer	TBD	Various : Various	-	-		0.664		-		-		-	0.000	0.664	-
		Subtotal	-	10.328		6.664		10.000		-		10.000	0.000	26.992	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Cyber / Integration	MIPR	TBD : TBD	-	1.000		1.000	Oct 2018	1.500	Oct 2019	-		1.500	0.000	3.500	-
		Subtotal	-	1.000		1.000		1.500		-		1.500	0.000	3.500	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ATEC Test Support	MIPR	Army Test Engineering Center : Various	-	3.802		1.600	Nov 2018	2.000	Nov 2019	-		2.000	0.000	7.402	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB6 / *Squad Multipurpose Equipment Transport (SMET)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Drop Testing	MIPR	NATICK : Various	-	-		0.400	Dec 2018	2.000	Oct 2019	-		2.000	0.000	2.400	-
		Subtotal	-	3.802		2.000		4.000		-		4.000	0.000	9.802	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	16.130		11.125		17.804		-		17.804	0.000	45.059	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

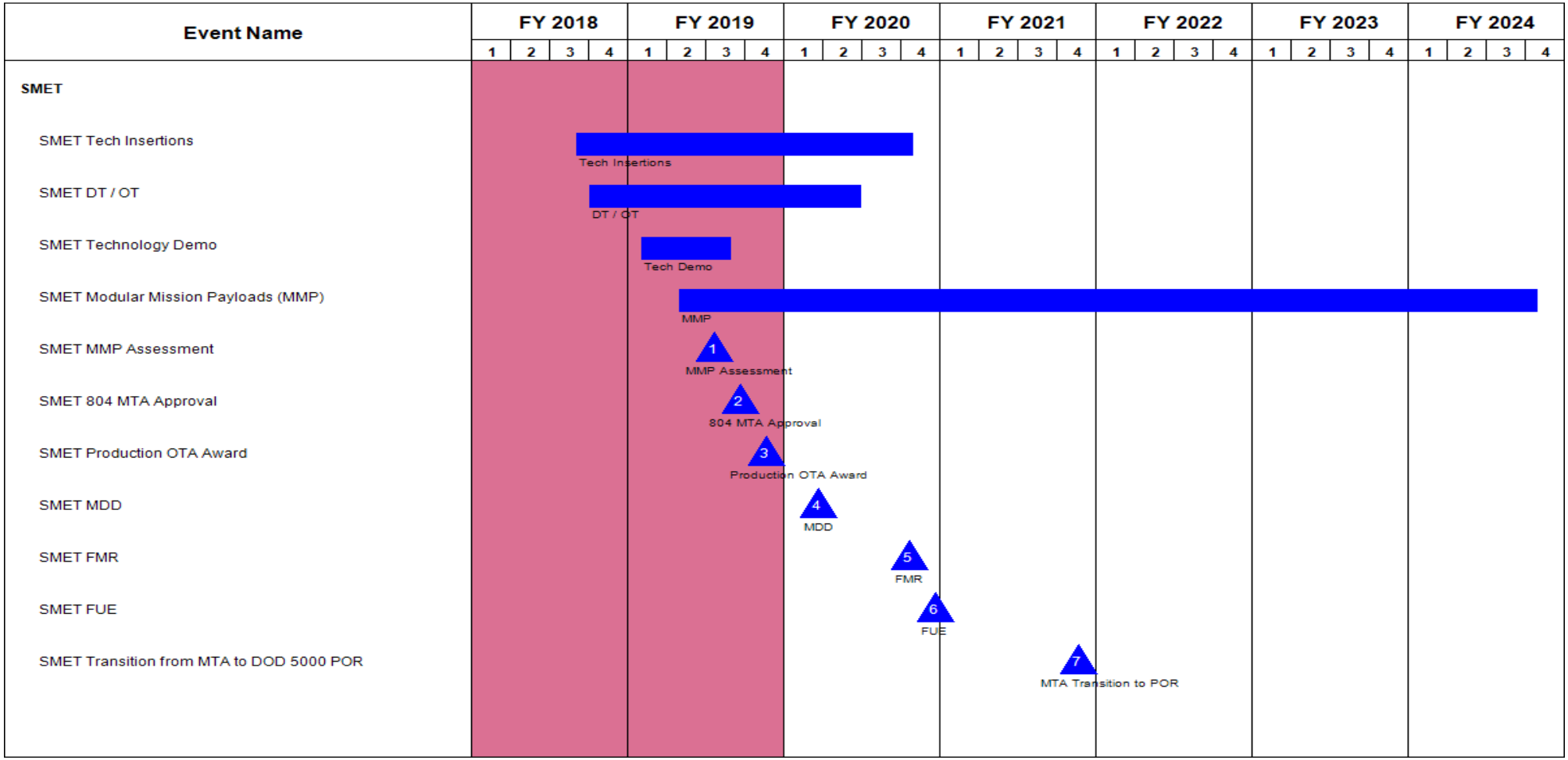

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB6 / *Squad Multipurpose Equipment Transport (SMET)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
SMET	1	2018	4	2022
SMET Tech Insertions	3	2018	4	2020
SMET DT / OT	4	2018	2	2020
SMET Technology Demo	1	2019	3	2019
SMET Modular Mission Payloads (MMP)	2	2019	4	2024
SMET MMP Assessment	3	2019	3	2019
SMET 804 MTA Approval	3	2019	3	2019
SMET Production OTA Award	4	2019	4	2019
SMET MDD	1	2020	1	2020
SMET FMR	4	2020	4	2020
SMET FUE	4	2020	4	2020
SMET Transition from MTA to DOD 5000 POR	4	2021	4	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB7 / *Robotics Enhanced Program (REP)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
FB7: *Robotics Enhanced Program (REP)*	-	7.683	9.387	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	17.070
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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.

This program has no FY 2020 Base or OCO RDTE funding.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Robotic Enhanced Program (REP) ***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, ARCIC) determined requirements as outlined in the Robotic and Autonomous Systems (RAS) Strategy. ***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 prepare for and complete Knowledge Point 3 (KP3) in 4QFY19, which will provide a status of the REP to the Program Executive Officer. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The REP program funding was zeroed out starting in FY 2020.	7.683	9.043	-
Title: FY 2019 SBIR / STTR Transfer ***Description:*** SBIR/STTR ***FY 2019 Plans:*** SBIR/STTR ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Adjust for FY 2019 SBIR/STTR Transfer	-	0.344	-
Accomplishments/Planned Programs Subtotals	7.683	9.387	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB7 / *Robotics Enhanced Program (REP)*

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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB7 / *Robotics Enhanced Program (REP)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	MIPR	Various : Multiple	-	2.447	Nov 2017	2.823	Apr 2019	-		-		-	0.000	5.270	-
		Subtotal	-	2.447		2.823		-		-		-	0.000	5.270	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.344	Oct 2018	-		-		-	0.000	0.344	-
		Subtotal	-	-		0.344		-		-		-	0.000	0.344	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Iteration 18.1	Various	Various : Multiple	-	0.037	Jul 2018	-		-		-		-	0.000	0.037	-
Iteration 18.2	Various	Various : Multiple	-	1.707	Jul 2018	-		-		-		-	0.000	1.707	-
Iteration 19.1	Various	Various : Multiple	-	-		2.846	Apr 2019	-		-		-	0.000	2.846	-
		Subtotal	-	1.744		2.846		-		-		-	0.000	4.590	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Iteration 18.1	Various	Various : Multiple	-	0.854	Aug 2018	-		-		-		-	0.000	0.854	-
Iteration 18.2	Various	Various : Multiple	-	1.402	Sep 2018	-		-		-		-	0.000	1.402	-
Iteration 19.1	Various	Various : Multiple	-	0.638	Jan 2019	1.374	Jun 2019	-		-		-	0.000	2.012	-
REP Out-of-Cycle Initiatives	Various	Various : Various	-	0.598	Jul 2018	2.000	Aug 2019	-		-		-	0.000	2.598	-
		Subtotal	-	3.492		3.374		-		-		-	0.000	6.866	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB7 / *Robotics Enhanced Program (REP)*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	7.683		9.387		-		-		-	0.000	17.070	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB7 / *Robotics Enhanced Program (REP)*

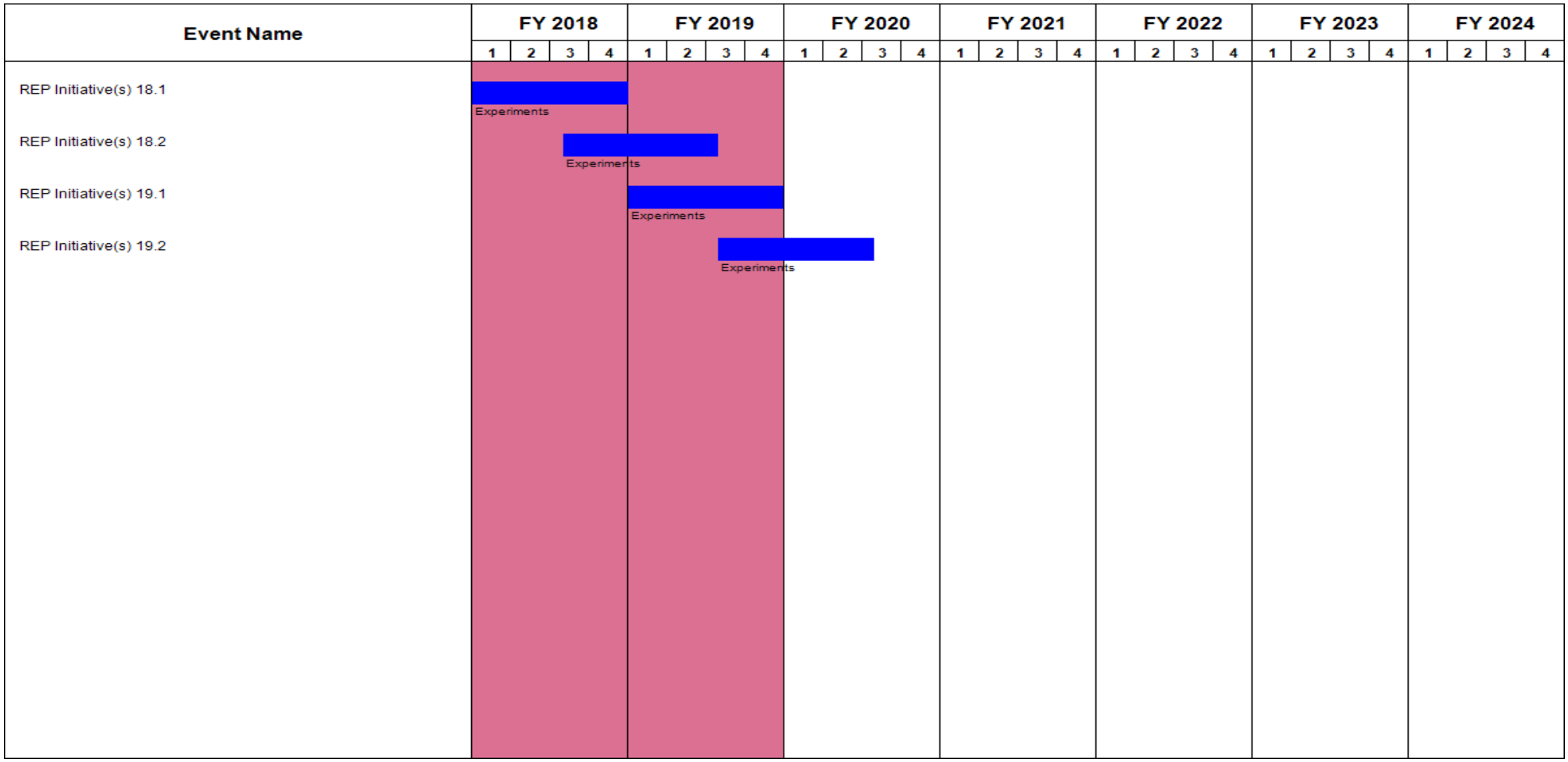

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB7 / *Robotics Enhanced Program (REP)*

Schedule Details

	Start		End	
Events	**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

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB8 / *Soldier Borne Sensor (SBS)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
FB8: *Soldier Borne Sensor (SBS)*	-	2.197	3.465	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.662
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Soldier Borne Sensor (SBS) is a small unmanned aerial vehicle. The 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 system is simple to deploy and use 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. Funding in this project aligns with Army's priorities in support of the National Defense Strategy.

In FY20, this project and funding will transition to PE: 0604827A / Soldier Systems - Warrior Dem/Val, Project FK4.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Soldier Borne Sensor (SBS) ***Description:*** The SBS is a small Unmanned Aerial System that 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 2019 Plans:*** FY 2019 Plans: The program will complete development of new technologies for Increment 2. The program will then utilize Other Transaction Authority (OTA) prototype projects to rapidly incorporate new technologies including GPS-denied operation and integration with the Soldier architecture into prototypes for evaluation. The OTA scope of work (technologies integrated) will be determined based on affordability. OTAs will be established with multiple manufacturers if affordable. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** In FY20, this program funding transitioned to PE: 0604827A / Soldier Systems - Warrior Dem/Val, Project FK4.	2.197	3.354	-
Title: FY 2019 SBIR / STTR Transfer ***Description:*** FY 2019 SBIR / STTR adjustment. ***FY 2019 Plans:*** FY 2019 SBIR / STTR adjustment. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	-	0.111	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB8 / *Soldier Borne Sensor (SBS)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 SBIR / STTR adjustment.			
Accomplishments/Planned Programs Subtotals	2.197	3.465	-

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• FK4: *Soldier Borne Sensor (SBS)*	-	-	1.512	-	1.512	1.213	2.239	3.548	1.317	0.000	9.829
• W63798: *Soldier Borne Sensor (SBS)*	24.000	21.680	23.362	-	23.362	25.927	11.160	19.101	25.293	Continuing	Continuing

Remarks

D. Acquisition Strategy

SBS achieved Milestone C September 2017. The program office is utilizing Defense Logistics Agency - Tailored Logistics Support contracts to procure Tranche 1 systems in FY18, FY19, and FY20.

SBS will initiate one or more prototype projects via other transaction agreement in FY19. The Tranche 2 SBS solution will be selected from these prototypes in FY21.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB8 / *Soldier Borne Sensor (SBS)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	Allot	Project Manager Soldier Sensors and Lasers : Fort Belvior, Virginia 22060	-	0.394	Jul 2018	0.244	Dec 2018	-		-		-	0.000	0.638	-
		Subtotal	-	0.394		0.244		-		-		-	0.000	0.638	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Better Data Thermal Camera	MIPR	NVESD : Fort Belvoir, Virginia 22060	-	0.472	Jul 2018	1.933	Jan 2019	-		-		-	0.000	2.405	-
Obstacle Avoidance	MIPR	NSRDEC : NATICK, Massachusetts 01760	-	-		0.400	Nov 2018	-		-		-	0.000	0.400	-
OTA Incremental Development	MIPR	NSRDEC : NATICK, Massachusetts 01760	-	-		0.533	Jul 2019	-		-		-	0.000	0.533	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.111		-		-		-	0.000	0.111	-
		Subtotal	-	0.472		2.977		-		-		-	0.000	3.449	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix Support	MIPR	Various : Various	-	0.552	May 2018	0.244	Dec 2018	-		-		-	0.000	0.796	-
		Subtotal	-	0.552		0.244		-		-		-	0.000	0.796	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB8 / *Soldier Borne Sensor (SBS)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation Support	MIPR	Army Test and Evauation Command : White Sands Missile Range, New Mexico	-	0.779	Sep 2018	-		-		-		-	0.000	0.779	-
		Subtotal	-	0.779		-		-		-		-	0.000	0.779	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	2.197		3.465		-		-		-	0.000	5.662	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB8 / *Soldier Borne Sensor (SBS)*

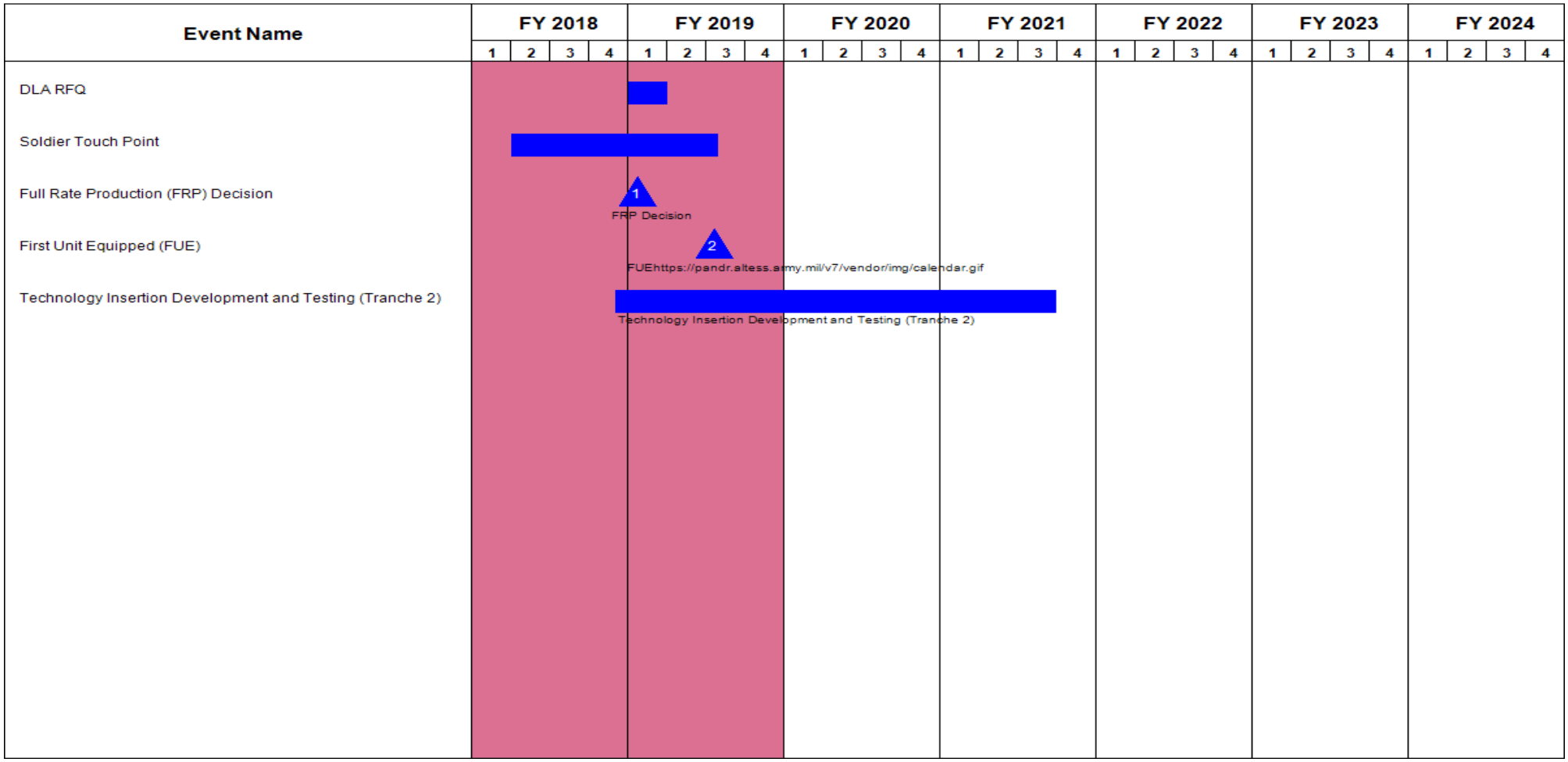

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB8 / *Soldier Borne Sensor (SBS)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
DLA RFQ	1	2019	1	2019
Soldier Touch Point	2	2018	3	2019
Full Rate Production (FRP) Decision	1	2019	1	2019
First Unit Equipped (FUE)	3	2019	3	2019
Technology Insertion Development and Testing (Tranche 2)	4	2018	3	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB9 / *MTRS Standardization*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
FB9: *MTRS Standardization*	-	1.150	9.043	7.000	-	7.000	0.000	0.000	0.000	0.000	0.000	17.193
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

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) units.

FY 2020 RDTE funds in the amount of $7.000 million will enable the CRS(H) program to complete the following: System Engineering, Program Management, design and test support, refurbishment of test assets from Fly-off #2, development, integration and testing of system-enhancing payloads (eg: dual arm manipulation, autonomy, mapping, etc.), contract data procurement, travel, and other expenses related to the CRS(H) RDTE program.

NOTE: $4.618 million of FY 2019 CRS(H) RDTE funds 655053FB9 Ground Robotics, MTRS Standardization, were reprogrammed to the FY 2019 CRS(H) OPA line W12001A EOD Robotics Systems Recapitalization during the Congressional enactment process.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Platform to Support Payload Development & Test ***Description:*** Testing of multi-shot disruptor and fire set for EOD robotics systems.	1.150	-	-
Title: Additive Manufacturing ***Description:*** Supports 3D printed part evaluative efforts. ***FY 2019 Plans:*** Funds will test the operational capability of 3D printed parts with robotic systems. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** No funding required in FY20	-	0.524	-
Title: CRS(H) IPT Matrix Support Salary Support ***Description:*** CRS(H) RDTE funding to support engineering and various test efforts to include redesign of test articles, software, engineering test support staff salaries, and System Engineering Program Management (SEPM) costs.	-	1.004	1.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB9 / *MTRS Standardization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
FY 2019 Plans: Funding is for CRS(H) IPT Matrix salary support. ***FY 2020 Plans:*** Funding to support engineering activities, testing, logistics, and salaries for IPT and program management costs to include travel and miscellaneous expenses associated with the CRS(H) RDTE efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.			
Title: CRS(H) testing ***Description:*** CRS(H) cyber security and performance testing efforts. ***FY 2019 Plans:*** Funding is for testing of CRS(H) ***FY 2020 Plans:*** Funding is provided for cyber security testing, cyber security scans, and additional reliability and performance testing. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.	-	6.970	2.000
Title: CRS(H) test article refurbishment ***Description:*** CRS(H) test article refurbishment for payloads. ***FY 2020 Plans:*** Funding is to refurbish test articles to "Like-New" condition to support payload integration activities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.	-	-	0.400
Title: CRS(H) contract data ***Description:*** CRS(H) data required to support Materiel Release. ***FY 2020 Plans:*** Funding is provided for Risk Management Framework (RMF) artifacts, Logistics data, provisioning, training development, and engineering data. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	-	-	3.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB9 / *MTRS Standardization*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Delta due to breaking out funding into more detail for FY 2020 Plans.			
Title: CRS(H) Payload Development ***Description:*** CRS(H) payload development, integration, and testing activities. ***FY 2020 Plans:*** Funding is provided for CRS(H) payload development, integration, and testing activities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Delta due to breaking out funding into more detail for FY 2020 Plans.	-	-	0.600
Title: FY 2019 SBIR / STTR Transfer ***Description:*** SBIR / STTR ***FY 2019 Plans:*** SBIR / STTR ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Adjust for FY 2019 SBIR / STTR transfer	-	0.545	-
Accomplishments/Planned Programs Subtotals	1.150	9.043	7.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• W12001: *EOD Robotics Systems Recapitalization*	10.073	17.736	23.115	-	23.115	26.559	-	-	-	0.000	77.483

Remarks

This is a shared line with Robotic Logistic Support Center. Funding split is as follows:

Program	FY 2018	FY 2019	FY 2020	FY 2021
EOD	$10,073	$524	$6,515	$3,059
CRS(H)	$0	$4,618	$16,600	$23,500

NOTE: $10.000 million CRS(H) RDTE funds were reprogrammed to FY 2019 CRS(H) OPA line W12001A EOD Robotics Systems Recapitalization.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB9 / *MTRS Standardization*

D. Acquisition Strategy

Procure mobility platforms from existing IDIQ contract. Utilize Other Transactional Authority contract for additive manufacturing effort.

The CRS(H) acquisition strategy will enter at Milestone C and award up to three Other Transactional Authority (OTA) agreements to conduct a dual phase fly-off. The CRS(H) program will utilize fly-off results to down-select to one OEM and proceed directly into production in FY 2019 and field under a Conditional Materiel Release (CMR) in FY 2020. The CRS(H) program will complete all required engineering and logistics activities to support Full Materiel Release (FMR) and Full Rate Production (FRP) in FY 2021.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB9 / *MTRS Standardization*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CRS(H) Program Management costs	Various	Various : Multiple	-	-		1.004	Dec 2018	1.000	Oct 2019	-		1.000	0.000	2.004	-
		Subtotal	-	-		1.004		1.000		-		1.000	0.000	2.004	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Platform to Support Payload Developement	C/TBD	Robot Logistics Support Center (RLSC) : Selfridge Air National Guard Base (SANG)	-	1.150	Feb 2018	-		-		-		-	0.000	1.150	-
CRS(H) Payload Development	Various	Various : Multiple	-	-		-		0.600	Dec 2019	-		0.600	0.000	0.600	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.545	Oct 2018	-		-		-	0.000	0.545	-
		Subtotal	-	1.150		0.545		0.600		-		0.600	0.000	2.295	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CRS(H) Contract data	SS/FFP	TBD : TBD	-	-		-		3.000	Nov 2019	-		3.000	0.000	3.000	-
		Subtotal	-	-		-		3.000		-		3.000	0.000	3.000	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CRS(H) System Evaluation	Various	Various : Multiple	-	-		6.970	Feb 2019	2.000	Nov 2019	-		2.000	0.000	8.970	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FB9 / *MTRS Standardization*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
CRS(H) Test Article refurbishment	SS/FFP	TBD : TBD	-	-		-		0.400	Nov 2019	-		0.400	0.000	0.400	-
Additive Manufacturing524	TBD	TBD : TBS	-	-		0.524	Jan 2019	-		-		-	0.000	0.524	-
		Subtotal	-	-		7.494		2.400		-		2.400	0.000	9.894	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	1.150		9.043		7.000		-		7.000	0.000	17.193	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB9 / *MTRS Standardization*

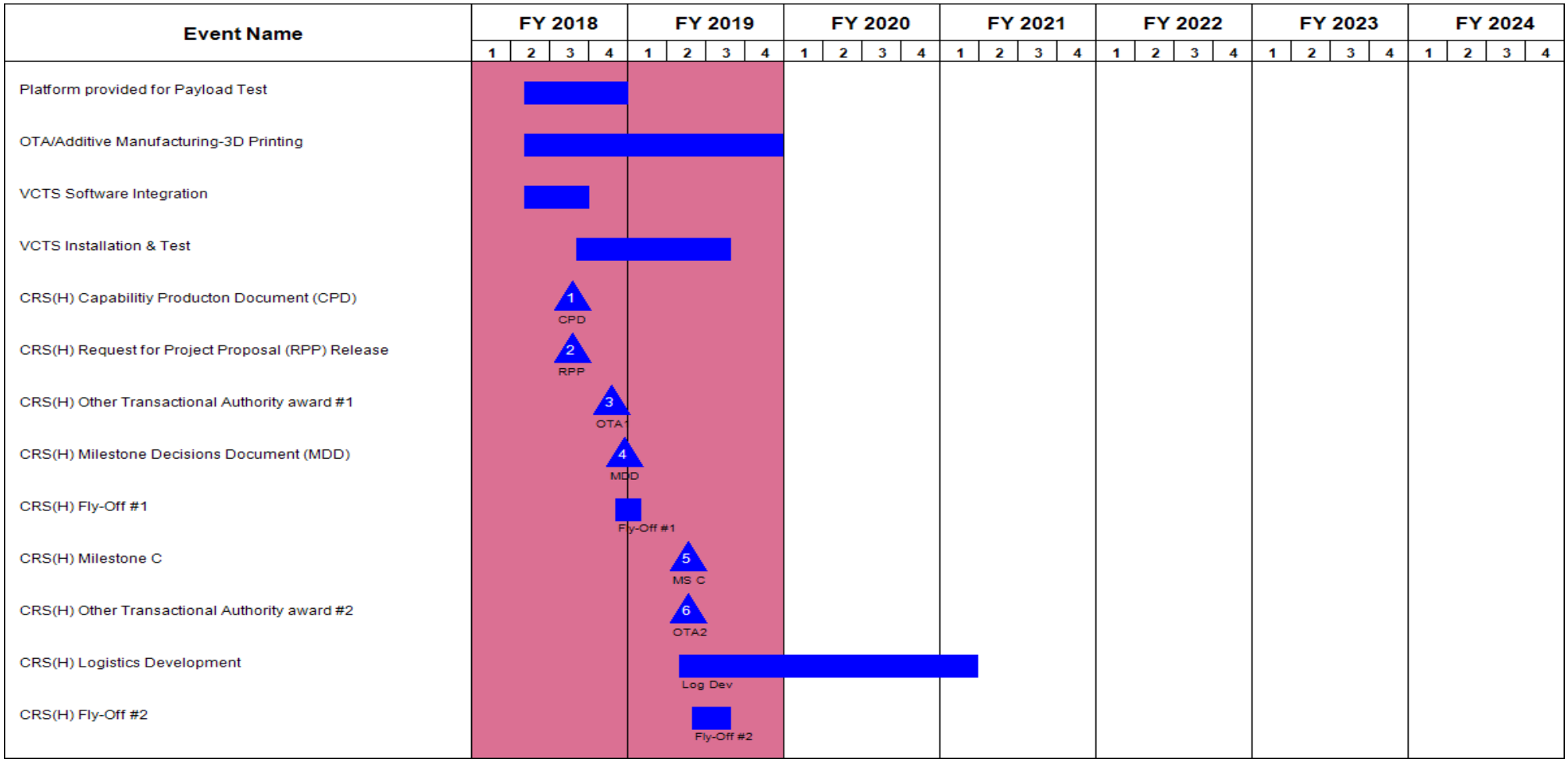

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB9 / *MTRS Standardization*

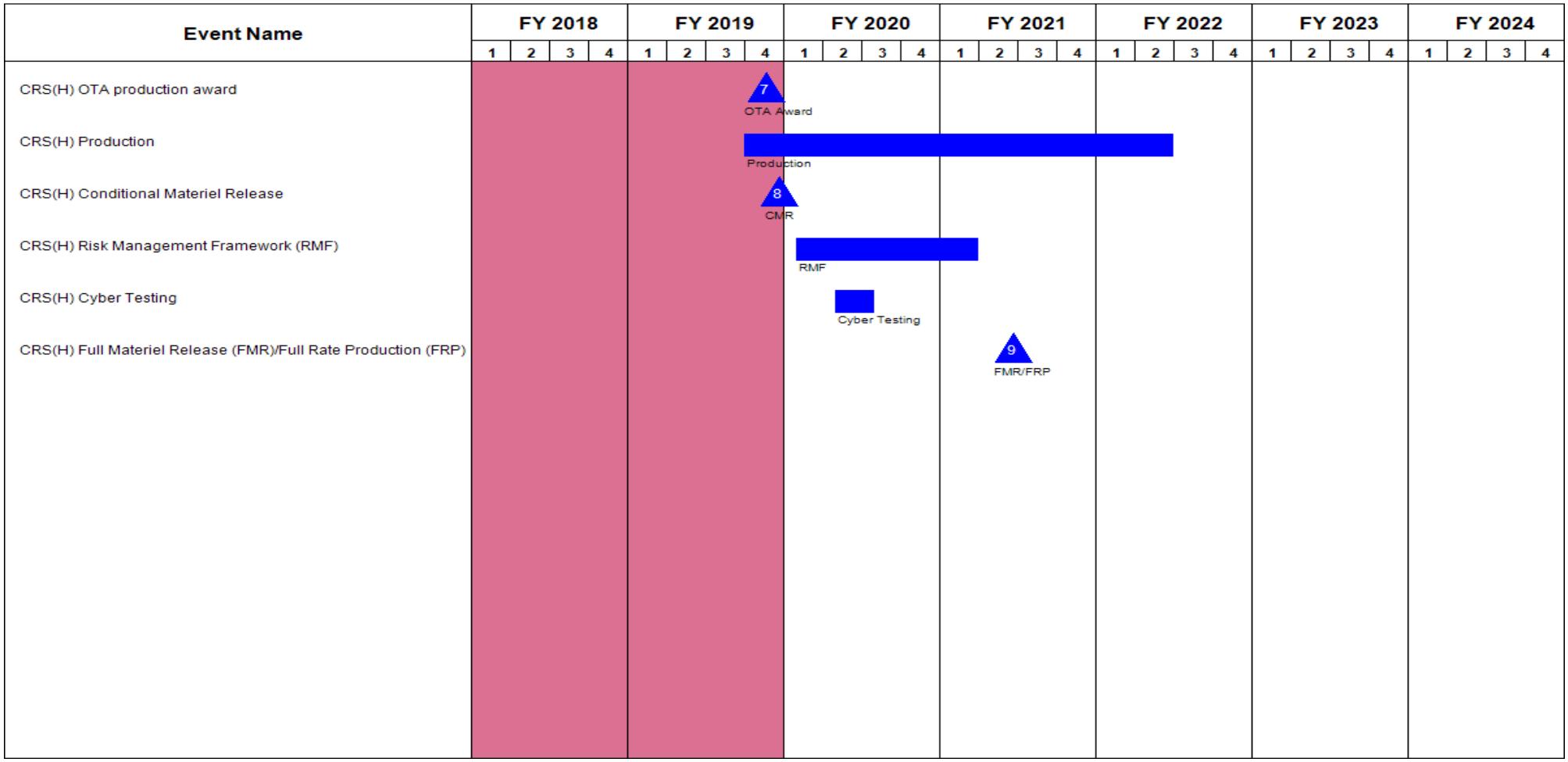

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FB9 / *MTRS Standardization*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Platform provided for Payload Test	2	2018	4	2018
OTA/Additive Manufacturing-3D Printing	2	2018	4	2019
VCTS Software Integration	2	2018	3	2018
VCTS Installation & Test	3	2018	3	2019
CRS(H) Capabilitiy Producton Document (CPD)	3	2018	3	2018
CRS(H) Request for Project Proposal (RPP) Release	3	2018	3	2018
CRS(H) Other Transactional Authority award #1	4	2018	4	2018
CRS(H) Milestone Decisions Document (MDD)	4	2018	4	2018
CRS(H) Fly-Off #1	4	2018	1	2019
CRS(H) Milestone C	2	2019	2	2019
CRS(H) Other Transactional Authority award #2	2	2019	2	2019
CRS(H) Logistics Development	2	2019	1	2021
CRS(H) Fly-Off #2	2	2019	3	2019
CRS(H) OTA production award	4	2019	4	2019
CRS(H) Production	4	2019	2	2022
CRS(H) Conditional Materiel Release	4	2019	4	2019
CRS(H) Risk Management Framework (RMF)	1	2020	1	2021
CRS(H) Cyber Testing	2	2020	3	2020
CRS(H) Full Materiel Release (FMR)/Full Rate Production (FRP)	2	2021	2	2021

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FG8 / *Common Robotic Controller*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
FG8: *Common Robotic Controller*	-	0.000	2.964	1.186	-	1.186	1.209	1.233	1.258	1.283	0.000	9.133
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Universal Robotic Controller (URC) 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 (OCUs) for each system. A controlled UxS may be mobile or stationary, can be smart learning, and self-adaptive. Two URCs 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 URC 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 intent of this requirement is allow the Soldier at battalion and below to use the URC to operate unmanned aerial systems (e.g. Raven, PUMA, Short Range Micro (SRM), etc.) and unmanned ground vehicles (e.g. CRS(I), CRS(V),CRS(H), SMET, MTRS INC II, Light Reconnaissance (LR), Wingman, etc.) and emerging unmanned air/ground systems. The URC is defined in the Common Robotic System (Individual) (CRS(I)) Capability Development Document (CDD) and is included in the CRS(I) acquisition. A standalone requirements document is being developed at a date TBD.

FY 2020 RDTE funding in the amount of $1.186 million will be utilized to complete test evaluation and LOG product development under the CRS(I) contract, mature the Universal Robotic Controller to meet the requirements in the CDD and emerging programs of record, controller software updates, and integration and test the URC into other Unmanned Ground Vehicles (UGV) or Unmanned Aerial Vehicles (UAS) programs of record via an Engineering Change Proposal (ECP). This funding also supports programmatic risk mitigation activities including, but not limited to: Cyber Security Controls (i.e. Risk Management Framework), commonality directives, payloads, sensors, condition based maintenance, electronics, standard interfaces and architectures, autonomous operations and other emerging technologies, interoperability (IOP), and analysis of collaborative operations with various Unmanned Systems assigned at Battalion and below in addition to any program management support costs associated with these activities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: URC improves Soldier situational awareness while reducing cognitive load on Soldiers and the robotics portfolio logistics footprint	-	2.869	1.186
Description: The Universal Robotic Controller (URC) 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 URCs 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 URC 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			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FG8 / *Common Robotic Controller*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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 URC is approved, the weaponized payloads will be controlled via several fail-safe mechanisms to prevent accidental discharge. ***FY 2019 Plans:*** FY 2019 RDTE funds will be utilized to conduct user testing and select a Universal Controller. ***FY 2020 Plans:*** FY 2020 RDTE funds will be utilized to complete test evaluation and Log product development under the CRS(I) contract, mature the Universal Robotic Controller to meet the requirements in the CDD and emerging programs of record, controller software updates, risk mitigation activities, and integration and test the URC into other Unmanned Ground Vehicles (UGV) or Unmanned Aerial Vehicles (UAS) programs of record via an Engineering Change Proposal (ECP). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The efforts listed below are in support of continued developmental efforts for URC Program Efforts once grouped together in FY 2019 Accomplishments/Planned Programs are broken out in FY 2020 for increased transparency.			
Title: FY 2019 SBIR / STTR Transfer ***Description:*** SBIR / STTR ***FY 2019 Plans:*** SBIR/STTR ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Adjust for FY 2019 SBIR / STTR Transfer	-	0.095	-
Accomplishments/Planned Programs Subtotals	-	2.964	1.186

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• G99595: *Common Robotic System-Individual (CRS-I)*	-	3.161	2.285	-	2.285	3.952	4.135	4.438	4.632	0.000	22.603
• G93696: *Common Robotic System - Individual (CRS-I)*	-	-	30.387	-	30.387	37.981	9.000	-	-	0.000	77.368

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FG8 / *Common Robotic Controller*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost

Remarks

D. Acquisition Strategy

The Universal Robotic Controller (URC) is a component of the CRS(I) and does not have its own Acquisition Strategy at this time.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FG8 / *Common Robotic Controller*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management support	Various	Various : Multiple	-	-		0.187	Apr 2019	0.086	Oct 2019	-		0.086	0.000	0.273	-
		Subtotal	-	-		0.187		0.086		-		0.086	0.000	0.273	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Engineering Manufacturing & Development	C/CPFF	TBD : TBD	-	-		-		0.200	Oct 2019	-		0.200	0.000	0.200	-
Engineering Change Proposal	TBD	Various : Multiple	-	-		-		0.500	Oct 2019	-		0.500	0.000	0.500	-
Software support	Various	Various : Various	-	-		1.284	Apr 2019	-		-		-	0.000	1.284	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.095	Oct 2018	-		-		-	0.000	0.095	-
		Subtotal	-	-		1.379		0.700		-		0.700	0.000	2.079	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Log Manuals	Various	Various : Multiple	-	-		0.738	May 2019	0.200	Oct 2019	-		0.200	0.000	0.938	-
		Subtotal	-	-		0.738		0.200		-		0.200	0.000	0.938	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ATEC testing	Various	Varous : Multiple	-	-		-		0.200	Dec 2019	-		0.200	0.000	0.200	-
Contractor PQT	Various	Endeavor & QinetiQ : Massachusetts	-	-		0.660	Apr 2019	-		-		-	0.000	0.660	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605053A / *Ground Robotics*	Project (Number/Name) FG8 / *Common Robotic Controller*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Subtotal			-	-		0.660		0.200		-		0.200	0.000	0.860	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		2.964		1.186		-		1.186	0.000	4.150	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FG8 / *Common Robotic Controller*

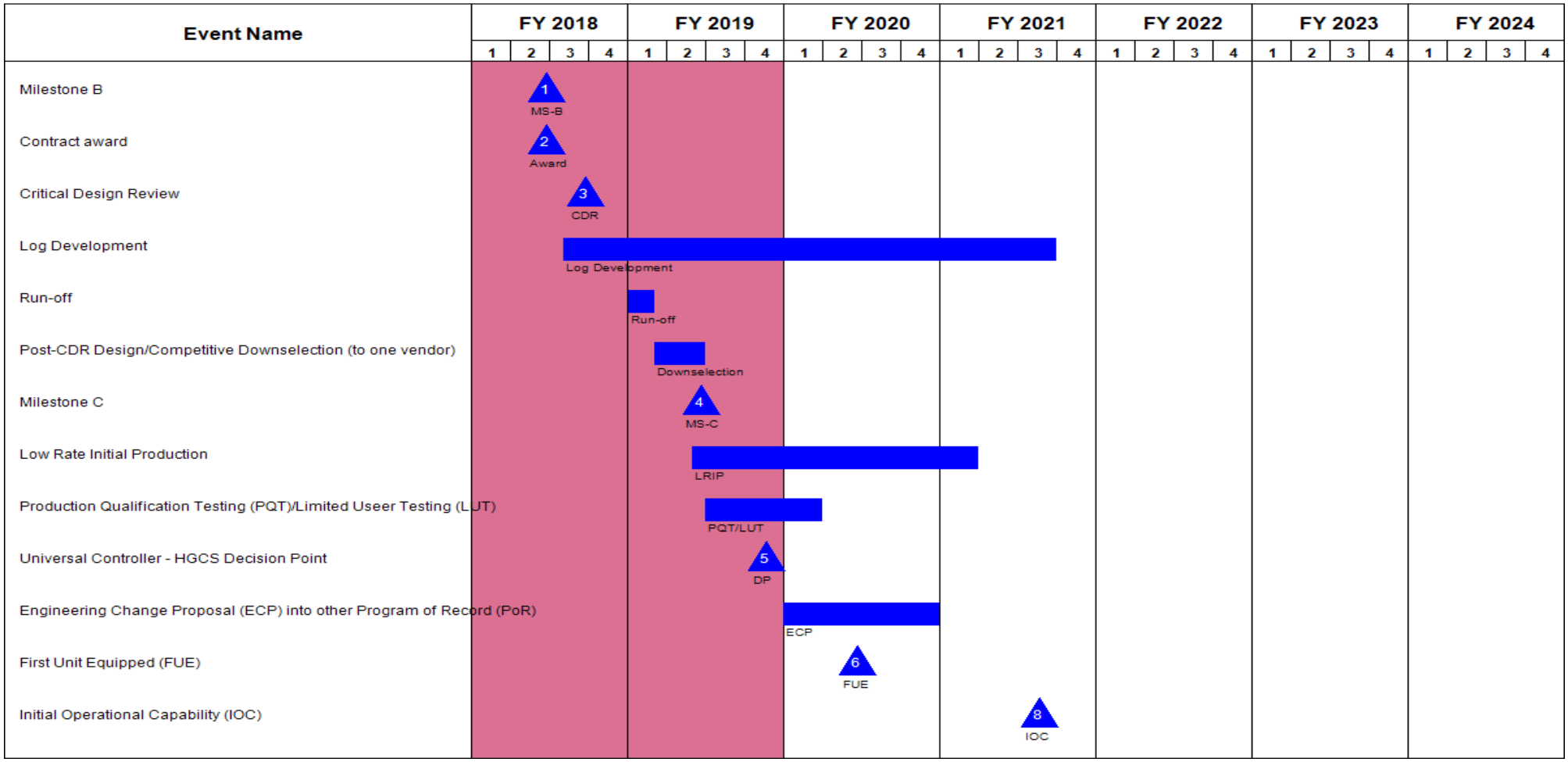

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FG8 / *Common Robotic Controller*

Event Name	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	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 Decision													FRP															

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605053A / *Ground Robotics*	**Project (Number/Name)** FG8 / *Common Robotic Controller*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Milestone B	2	2018	2	2018
Contract award	2	2018	2	2018
Critical Design Review	3	2018	3	2018
Log Development	3	2018	3	2021
Run-off	1	2019	1	2019
Post-CDR Design/Competitive Downselection (to one vendor)	1	2019	2	2019
Milestone C	2	2019	2	2019
Low Rate Initial Production	2	2019	1	2021
Production Qualification Testing (PQT)/Limited Useer Testing (LUT)	3	2019	1	2020
Universal Controller - HGCS Decision Point	4	2019	4	2019
Engineering Change Proposal (ECP) into other Program of Record (PoR)	1	2020	4	2020
First Unit Equipped (FUE)	2	2020	2	2020
Initial Operational Capability (IOC)	3	2021	3	2021
Full Rate Production Decision	1	2021	1	2021

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605054A / *Emerging Technology Initiatives*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	42.813	45.896	-	45.896	46.961	51.222	53.285	48.518	0.000	288.695
FI3: *Rapid Capability Development and Maturation*	-	0.000	42.813	45.896	-	45.896	46.961	51.222	53.285	48.518	0.000	288.695

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)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	42.866	41.726	-	41.726
Current President's Budget	0.000	42.813	45.896	-	45.896
Total Adjustments	0.000	-0.053	4.170	-	4.170
• Congressional General Reductions	-	-0.053			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	4.170	-	4.170

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605054A / *Emerging Technology Initiatives*	Project (Number/Name) FI3 / *Rapid Capability Development and Maturation*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
FI3: *Rapid Capability Development and Maturation*	-	0.000	42.813	45.896	-	45.896	46.961	51.222	53.285	48.518	0.000	288.695
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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 in the immediate, near- and mid-terms. 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); Signals Intelligence (SIGINT); Unmanned Aerial Vehicles (UAV) and Counter UAV (C-UAV); Communications; Positioning, Navigation and Timing (PNT); Survivability; Long Range Precision Fires 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. Funding may also be used to acquire specialized expertise to execute an initiative.

The Army RCO expedites the provisioning and fielding of critical combat materiel capabilities to the Warfighter to meet Combatant Commanders' needs. 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), Signals Intelligence (SIGINT), Unmanned Aerial Vehicles (UAV) and Counter UAV (C-UAV), Communications, Position, Navigation and Timing (PNT), Survivability, and Long Range Precisions Fires Directed Requirements (DR) and Operational Needs Statements (ONS). In addition, any other operational needs that become a priority as designated by the Army Rapid Capabilities Office Board of Directors (BOD).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Maturation, Prototyping, Assessment, and Integration of Emerging and Essential Technologies	-	42.813	45.896
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. includes air and ground platform integration.			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FI3 / *Rapid Capability Development and Maturation*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
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. ***FY 2020 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 Artificial Intelligence Cyber, EW, SIGINT, UAV, C-UAV, Communications, PNT, Survivability, Long Range Precision Fires, 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. This also funds RCO labor (Government matrix and contractor), service contracts, travel, training, supplies, facilities and Information Technology (IT) required to execute initiative. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 program increase reflects funding to support OSD efforts as well as core and matrix support costs for the RCO.			
Accomplishments/Planned Programs Subtotals	-	42.813	45.896

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 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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FI3 / *Rapid Capability Development and Maturation*

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605054A / *Emerging Technology Initiatives*	Project (Number/Name) FI3 / *Rapid Capability Development and Maturation*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Matrix, Contractor	Various	TBD : Various	-	-		-		9.803		-		9.803	0.000	9.803	-
Facilities, IT/Supplies, Travel, Training	Various	TBD : Various	-	-		-		3.587		-		3.587	0.000	3.587	-
		Subtotal	-	-		-		13.390		-		13.390	0.000	13.390	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Emerging Technologies Development	Various	TBD : Various	-	-		20.378		13.327		-		13.327	0.000	33.705	-
OSD - EW/Cyber Ground PoDs Development	Various	TBD : Various	-	-		8.800		-		-		-	0.000	8.800	-
FY 2019 SBIR / STTR Transfer	TBD	TBD : Various	-	-		1.569		-		-		-	0.000	1.569	-
		Subtotal	-	-		30.747		13.327		-		13.327	0.000	44.074	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Initiative Engineering Support	TBD	TBD : Various	-	-		2.066		4.629		-		4.629	0.000	6.695	-
		Subtotal	-	-		2.066		4.629		-		4.629	0.000	6.695	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OSD - EW/Cyber Ground PoDs Test	TBD	TBD : Various	-	-		2.000		-		-		-	0.000	2.000	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605054A / *Emerging Technology Initiatives*	Project (Number/Name) FI3 / *Rapid Capability Development and Maturation*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
OSD - UCIDS Test	TBD	TBD : Various	-	-		2.000		-		-		-	0.000	2.000	-
Emerging Technologies Test & Evaluation	TBD	TBD : Various	-	-		6.000		14.550		-		14.550	0.000	20.550	-
		Subtotal	-	-		10.000		14.550		-		14.550	0.000	24.550	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		42.813		45.896		-		45.896	0.000	88.709	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FI3 / *Rapid Capability Development and Maturation*

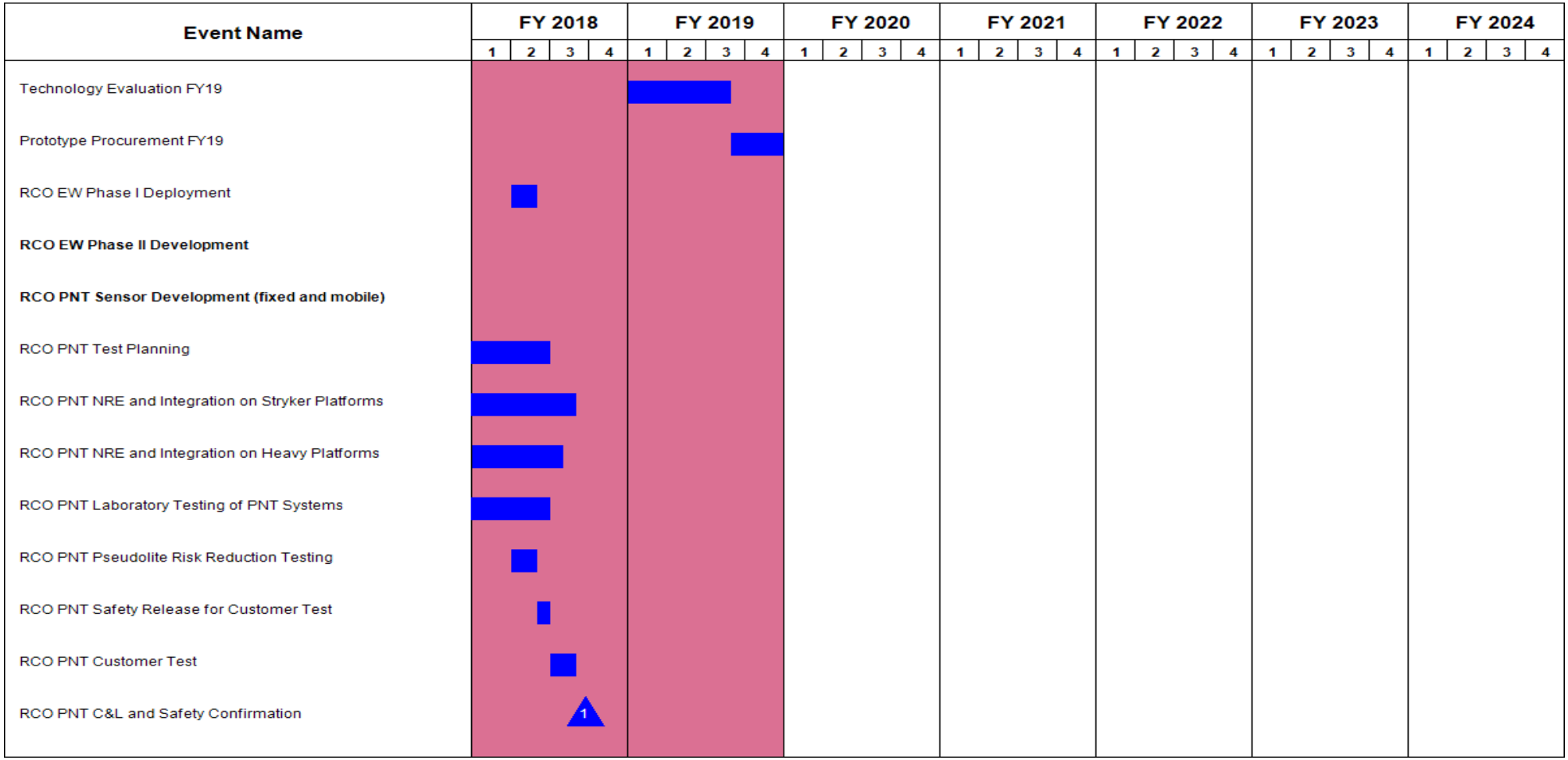

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FI3 / *Rapid Capability Development and Maturation*

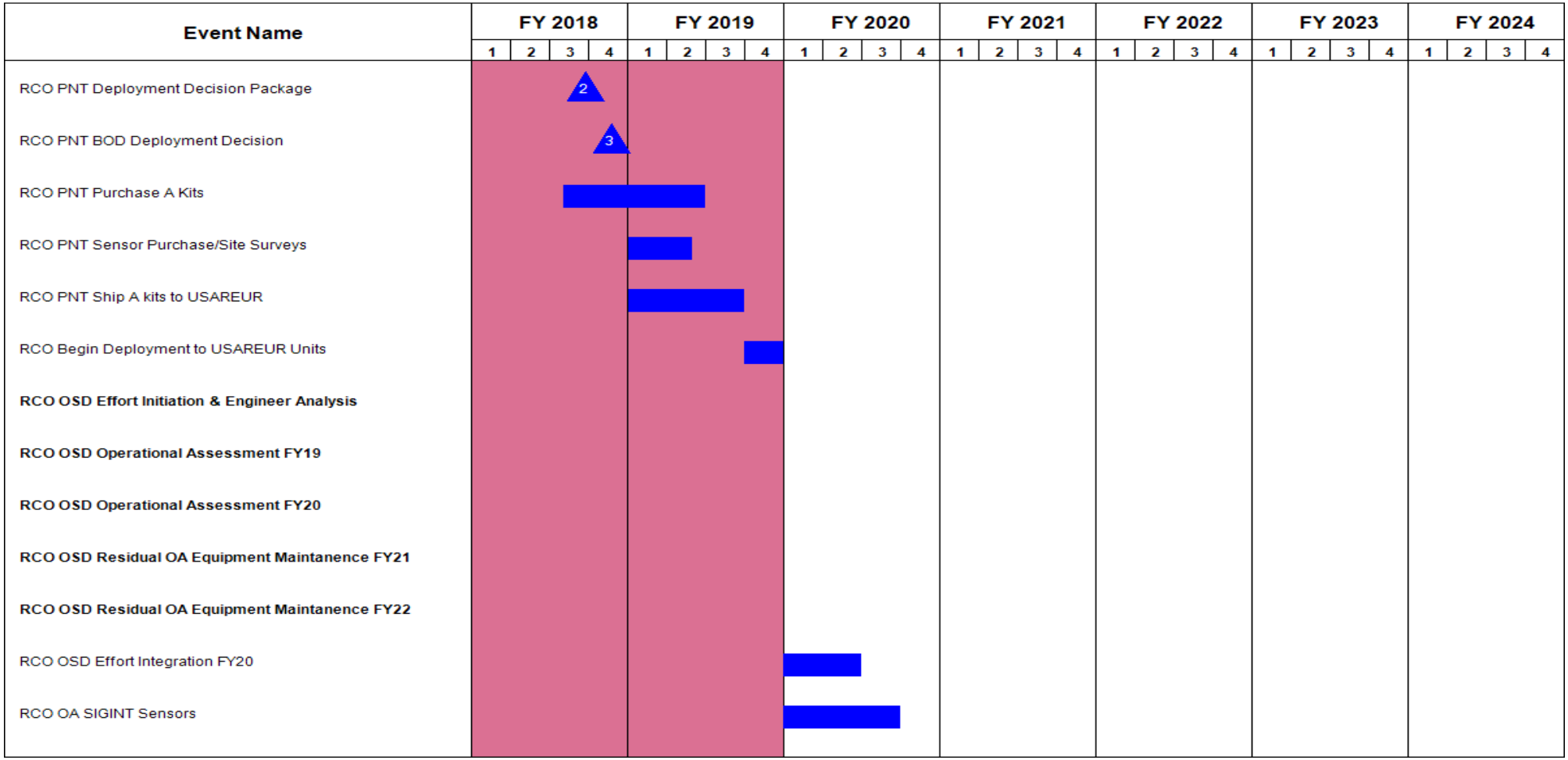

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FI3 / *Rapid Capability Development and Maturation*

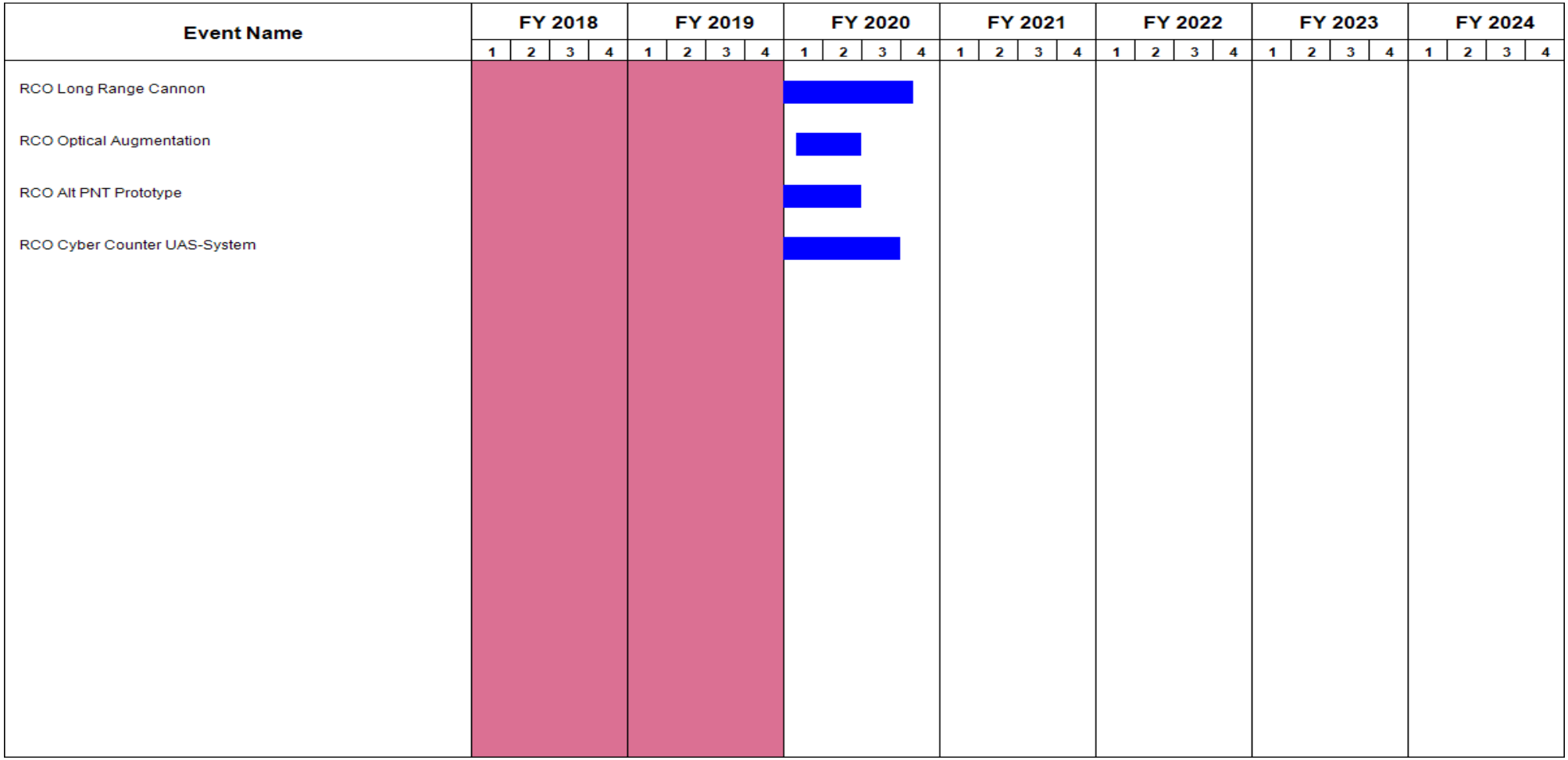

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FI3 / *Rapid Capability Development and Maturation*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Technology Evaluation FY19	1	2019	3	2019
Prototype Procurement FY19	3	2019	4	2019
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
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	3	2020	4	2020

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605054A / *Emerging Technology Initiatives*	**Project (Number/Name)** FI3 / *Rapid Capability Development and Maturation*

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
RCO OSD Residual OA Equipment Maintanence FY21	1	2021	4	2021
RCO OSD Residual OA Equipment Maintanence FY22	1	2022	4	2022
RCO OSD Effort Integration FY20	1	2020	2	2020
RCO OA SIGINT Sensors	1	2020	3	2020
RCO Long Range Cannon	1	2020	4	2020
RCO Optical Augmentation	1	2020	2	2020
RCO Alt PNT Prototype	1	2020	2	2020
RCO Cyber Counter UAS-System	1	2020	3	2020

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605203A / *Army System Development & Demonstration*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	164.883	19.527	184.410	142.081	133.438	106.448	115.798	0.000	682.175
BR3: *Army System Development & Demonstration*	-	0.000	0.000	164.883	19.527	184.410	142.081	133.438	106.448	115.798	0.000	682.175

A. Mission Description and Budget Item Justification

The Army System Development & Demonstration budget line includes multiple efforts across the Army's Battlefield Operational Systems necessary to support projects in engineering and manufacturing development for use on programs that have not received approval for full-rate. System performance is near or at planned operational system levels.

Projects are characterized by mature system development, integration, demonstration to support Milestone C decisions, conducting live fire test and evaluation, and initial operational test and evaluation of production representative articles.

Selected programs within this budget line will exhibit a logical progression of program phases, development and production funding within the FYDP, consistent with the Department's full funding policy.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	164.883	19.527	184.410
Total Adjustments	0.000	0.000	164.883	19.527	184.410
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	164.883	19.527	184.410

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605380A / *AMF Joint Tactical Radio System (JTRS)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	18.639	15.964	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	34.603
EG6: *Small Airborne Networking Radio (SANR)*	-	18.639	15.964	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	34.603

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.

On 17 July 18, the Army Acquisition Executive signed both the SANR Closeout Acquisition Decision Memorandum (ADM) and SANR Termination plan. This ADM and plan initiates a program termination action and directs an orderly shutdown of the SANR program.

The SANR subprogram (Project EG6) has no approved requirement and all funding has been withdrawn in FY 2020 and beyond.

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	8.965	15.984	43.457	-	43.457
Current President's Budget	18.639	15.964	0.000	-	0.000
Total Adjustments	9.674	-0.020	-43.457	-	-43.457
• Congressional General Reductions	-0.007	-0.020			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	10.000	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.319	-			
• Adjustments to Budget Years	-	-	-43.457	-	-43.457

Change Summary Explanation

The SANR subprogram (Project EG6) has no approved requirement.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EG6: *Small Airborne Networking Radio (SANR)*	-	18.639	15.964	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	34.603
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 SANR subprogram (Project EG6) has no approved requirement and funding has been withdrawn in FY 2020 and beyond.

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.

On 17 July 18, the Army Acquisition Executive signed both the SANR Closeout Acquisition Decision Memorandum (ADM) and SANR Termination plan. This ADM and plan initiates a program termination action and directs an orderly shutdown of the SANR program.

The SANR subprogram (Project EG6) has no approved requirement and funding has been withdrawn in FY 2020 and beyond.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Small Airborne Networking Radio (SANR) ***Description:*** Small Airborne Networking Radio (SANR) ***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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The SANR subprogram (Project EG6) has no approved requirement and funding has been withdrawn in FY 2020 and beyond.	8.639	5.379	-
Title: Air-Ground Integration Experimentation ***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 Link-16 handheld radios to conduct experimentation and develop concepts of operation in order to refine requirement for an objective capability. ***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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The SANR subprogram (Project EG6) has no approved requirement and funding has been withdrawn in FY 2020 and beyond.	10.000	10.000	-
Title: FY 2019 SBIR/ STTR Transfer ***FY 2019 Plans:*** Accounting for FY 2019 SBIR/ STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY19 Decrease to account for SBIR/ STTR transfer	-	0.585	-
Accomplishments/Planned Programs Subtotals	18.639	15.964	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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

N/A

D. Acquisition Strategy

On 17 July 18, the Army Acquisition Executive signed both the SANR Closeout Acquisition Decision Memorandum (ADM) and SANR Termination plan. This ADM and plan initiates a program termination action and directs an orderly shutdown of the SANR program.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMF-SA Business Operations Management and Support	Various	Various : Various	4.136	3.830		1.174		-		-		-	0.000	9.140	-
		Subtotal	4.136	3.830		1.174		-		-		-	0.000	9.140	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMF-SA - System Engineering and Requirements Validation	Various	Various : Various	2.329	2.587		2.552		-		-		-	0.000	7.468	-
AMF-SA - Air-Ground Integration Experimentation	Various	Various : Various	-	10.000		10.000		-		-		-	0.000	20.000	-
FY 2019 SBIR/ STTR Transfer	TBD	Various : Various	-	-		0.585		-		-		-	0.000	0.585	-
		Subtotal	2.329	12.587		13.137		-		-		-	0.000	28.053	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMF-SA - Logistics Support	Various	Various : Various	0.967	0.634		0.344		-		-		-	0.000	1.945	-
		Subtotal	0.967	0.634		0.344		-		-		-	0.000	1.945	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
AMF-SA - Test and Evaluation and Test Support	Various	Various : Various	1.614	1.588		1.309		-		-		-	0.000	4.511	-
AMF-SA- WNW Demonstration	Various	Various/AWA 17.1 : EPG	3.072	-		-		-		-		-	0.000	3.072	-
		Subtotal	4.686	1.588		1.309		-		-		-	0.000	7.583	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	12.118	18.639		15.964		-		-		-	0.000	46.721	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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)*

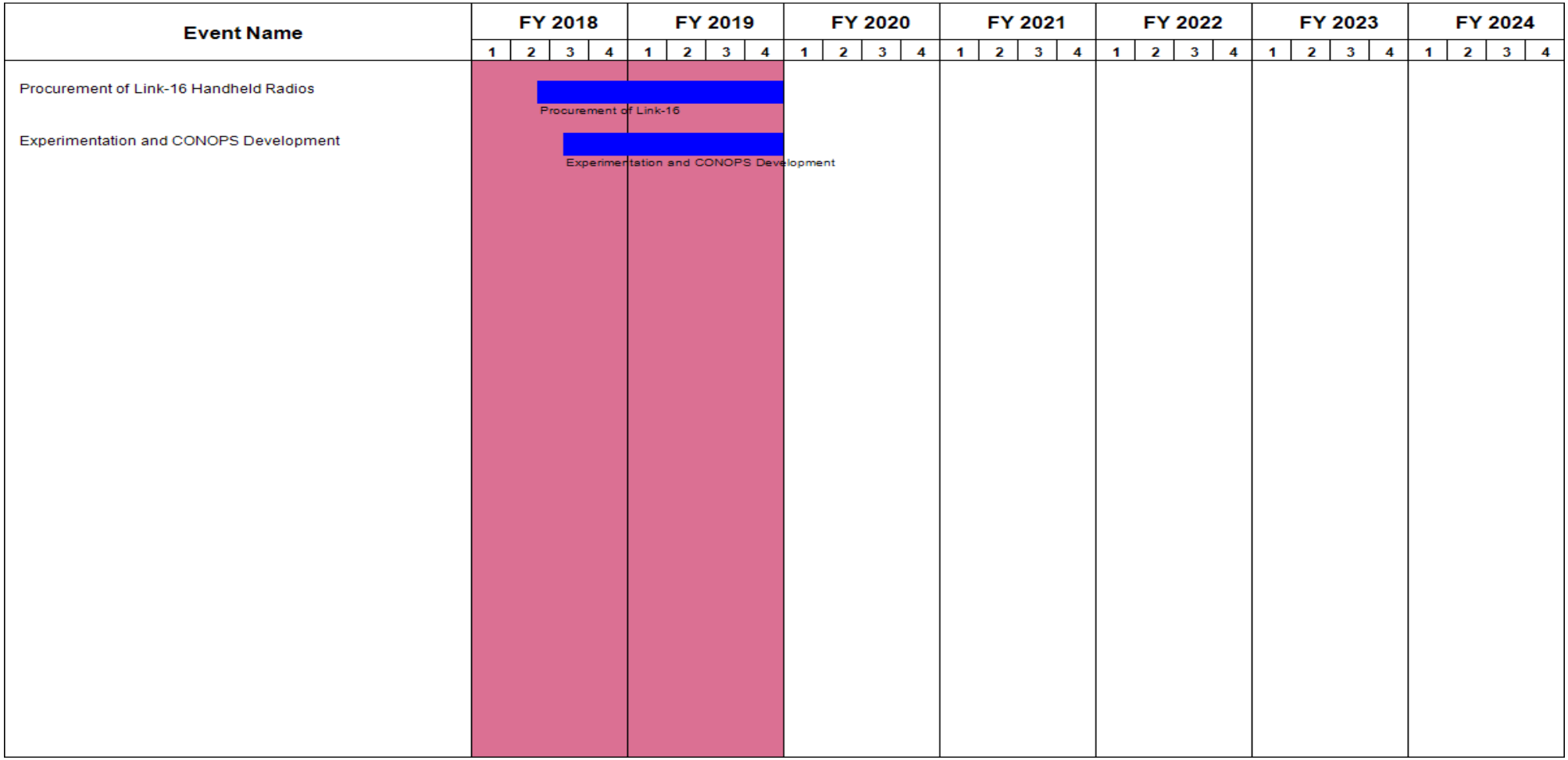

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605380A / *AMF Joint Tactical Radio System (JTRS)*	**Project (Number/Name)** EG6 / *Small Airborne Networking Radio (SANR)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Procurement of Link-16 Handheld Radios	2	2018	4	2019
Experimentation and CONOPS Development	3	2018	4	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
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)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	28.539	11.758	9.500	-	9.500	8.900	2.163	2.314	3.000	Continuing	Continuing
JA6: *Joint Air-To-Ground Missile (JAGM)*	-	28.539	11.758	9.500	-	9.500	8.900	2.163	2.314	3.000	Continuing	Continuing
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)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	34.626	11.773	2.966	-	2.966
Current President's Budget	28.539	11.758	9.500	-	9.500
Total Adjustments	-6.087	-0.015	6.534	-	6.534
• Congressional General Reductions	-0.024	-0.015			
• Congressional Directed Reductions	-4.900	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-1.163	-			
• Adjustments to Budget Years	-	-	6.534	-	6.534

Change Summary Explanation

FY 2018 adjustments reflect Congressional Reduction for Federal Funded Research and Development Centers (FFRDC) ($.024K), limited user test delay ($4.9M), and a SBIR/STTR transfer ($1.163M).
FY 2019 adjustments reflect Congressional Reduction for Federal Funded Research and Development Centers (FFRDC) ($.015K).
FY 2020 $6.534 million funding increase is a result of Captive Air Training Missile (CATM) Development.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
JA6: *Joint Air-To-Ground Missile (JAGM)*	-	28.539	11.758	9.500	-	9.500	8.900	2.163	2.314	3.000	Continuing	Continuing
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Engineering and Manufacturing Development (EMD) Qualification of JAGM and Apache Integration ***Description:*** The JAGM Product Office and Other Government Agencies (OGAs) completed developmental testing and qualification of the JAGM system, integration onto Apache AH-64E aircraft, lethality modeling, simulation, and effectiveness evaluation in support of Milestone (MS) C.	6.620	-	-	-	-
Title: Systems Engineering and MS C Preparation ***Description:*** The JAGM Product Office and OGAs completed all documentation, conducted evaluations, reviews and analyses to support a FY 2018 MS C decision.	4.060	-	-	-	-
Title: Full Rate Production (FRP) Decision Preparation ***Description:*** The JAGM Product Office and OGAs will confirm that JAGM is producible, as well as operable, safe, and logistically supportable. ***FY 2019 Plans:*** The JAGM Product Office will conduct government testing and Full Materiel Release (FMR) documentation to support a FRP decision. ***FY 2020 Base Plans:*** The JAGM Product Office will complete government testing and FMR documentation to support a FRP decision. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	2.030	0.673	0.526	-	0.526

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Funding decrease from FY 2019 to FY 2020 due to completion of FMR documentation efforts.					
Title: Post MS C Developmental, Integrated, and Operational Testing ***Description:*** The JAGM Product Office and OGAs will demonstrate JAGM Operational Suitability and Effectiveness with AH-64E. ***FY 2019 Plans:*** The JAGM Product Office and OGAs will complete Live Fire T&E, verify AH-64 software integration with JAGM 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decrease from FY 2019 to FY 2020 due to the completion of Initial Operational Test and Evaluation (IOT&E).	7.939	7.725	-	-	-
Title: Apache AH-64E and JAGM Software Integration ***Description:*** The JAGM Product Office will continue to work JAGM capability on E-model Apaches. ***FY 2019 Plans:*** The Apache Project Office, by way of Boeing Company, will complete and provide Pilot-Vehicle interface (PVI) capability that is required for seamless JAGM integration on the Apache platform. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding decrease from FY 2019 to FY 2020 due to the completion of Apache AH-64E and JAGM Software Integration.	4.875	2.625	-	-	-
Title: Integration and Threat Management ***Description:*** The JAGM Product Office and OGAs will continue objective platform review, analysis, and threat management. The JAGM Product Office and OGAs will perform technical assessments, concept studies, prepare documentation, and perform risk reduction efforts. ***FY 2019 Plans:***	-	0.304	3.629	-	3.629

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
The JAGM Product Office will manage and mitigate risk against emerging threats and conduct review and analysis of objective platforms. ***FY 2020 Base Plans:*** The JAGM Product Office and OGAs will conduct government software testing as well as review and analysis of objective Army platforms. Software testing includes risk mitigation against emerging threats. The JAGM Product Office and OGAs will perform technical assessments, concept studies, prepare documentation, and perform risk reduction efforts. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding increase from FY 2019 to FY 2020 due to risk mitigation against emerging threats and analysis of objective platforms.					
Title: CATM Development ***Description:*** The CATM is used for captive flight training and for qualification of aircrews to employ tactical missiles in combat. The JAGM Product Office will develop an inert missile configuration that will meet training needs. ***FY 2020 Base Plans:*** The JAGM Product Office and prime contractor will initiate JAGM CATM development. The prime contractor will develop CATM hardware and software. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding Increase from FY 2019 to FY 2020 due to initial CATM development.	-	-	2.776	-	2.776
Title: CATM Testing ***Description:*** The JAGM Product Office and OGAs will conduct development testing and qualification of the JAGM CATM; achieve air worthiness on threshold platforms. ***FY 2020 Base Plans:*** The JAGM Product Office and OGAs will begin Test and Evaluation and develop documentation for Air Worthiness Release. Test and Evaluation will verify AH-64E Software Integration through captive carry and environmental testing. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	-	-	2.569	-	2.569

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Funding increase from FY 2019 to FY 2020 due to initial CATM testing.					
Title: Engineering and Manufacturing Development (EMD) Contract ***Description:*** The JAGM prime contractor will conduct qualification of the production line and 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.	3.015	-	-	-	-
Title: FY 2019 SBIR / STTR Transfer ***Description:*** FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer	-	0.431	-	-	-
Accomplishments/Planned Programs Subtotals	28.539	11.758	9.500	-	9.500

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• C70302: *Joint Air-to-Ground MSLS (JAGM)*	178.432	256.462	0.000	233.353	233.353	213.608	220.900	213.611	208.833	0.000	1,525.199
• 0605450N: *Navy JAGM Missile RDT&E*	15.473	7.086	0.242	-	0.242	0.269	0.276	0.282	-	Continuing	Continuing
• 0206138M: *Navy JAGM Missile Procurement*	3.789	30.066	24.379	-	24.379	49.872	50.869	76.886	-	1,302.797	1,538.658

Remarks

D. Acquisition Strategy

The JAGM EMD acquisition approach outlined 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 back-ends and Guidance Section subsystems) occurred in FY 2016 - FY 2017. The long lead procurement was needed to facilitate Low Rate Initial Production (LRIP) I which was necessary to achieve Initial

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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)*

Operational Capability (IOC) and LRIP II. MS C was approved on 15 Jun 2018 and Initial Operational Test and Evaluation (IOT&E) is scheduled for the 3rd quarter of FY 2019.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Eng/ Project Management	C/LH	Various : Performers	78.493	6.034	Nov 2017	0.404	Oct 2018	0.550	Nov 2019	-		0.550	Continuing	Continuing	Continuing
		Subtotal	78.493	6.034		0.404		0.550		-		0.550	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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	67.241	3.015	Jul 2015	-		-		-		-	0.000	70.256	-
Apache Indefinite Delivery/ Indefinite Quantity (IDIQ) Contract	C/CPFF	Boeing Company : Mesa, AZ	11.600	4.875	May 2016	2.625		-		-		-	0.000	19.100	-
JAGM Engineering Services	SS/CPFF	Lockheed Martin : Orlando, FL	-	-		-		3.464	Mar 2020	-		3.464	0.000	3.464	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army		Date: March 2019
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)*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		0.431		-		-		-	0.000	0.431	-
		Subtotal	526.636	7.890		3.056		3.464		-		3.464	0.000	541.046	N/A

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)

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Gov Agencies	C/LH	Various : Performers	106.862	14.615	Nov 2017	8.298	Nov 2018	5.486	Nov 2019	-		5.486	0.000	135.261	Continuing
		Subtotal	106.862	14.615		8.298		5.486		-		5.486	0.000	135.261	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	711.991	28.539		11.758		9.500		-		9.500	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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)*

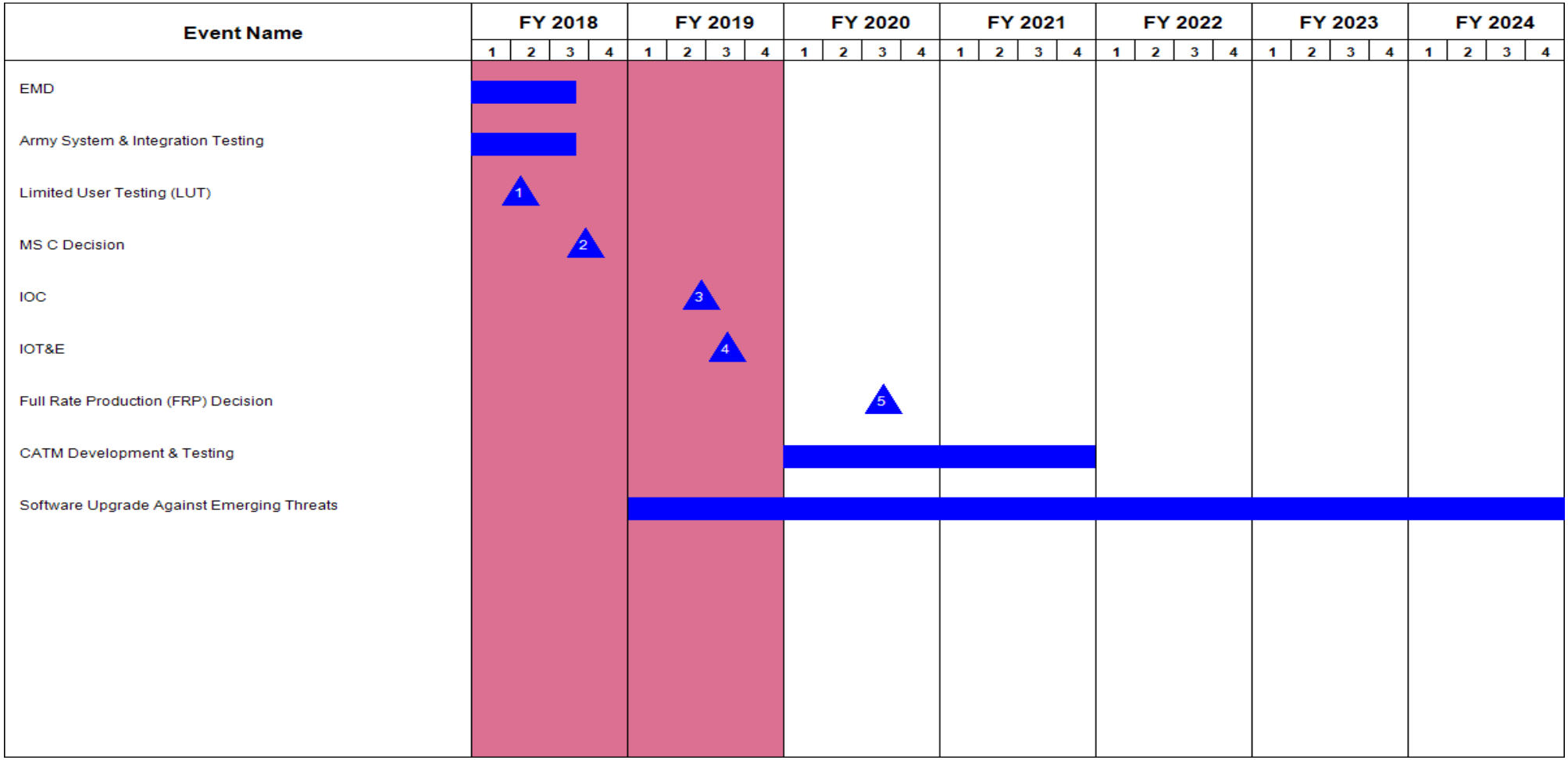

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605450A / *Joint Air-to-Ground Missile (JAGM)*	**Project (Number/Name)** JA6 / *Joint Air-To-Ground Missile (JAGM)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
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
IOC	2	2019	2	2019
IOT&E	3	2019	3	2019
Full Rate Production (FRP) Decision	3	2020	3	2020
CATM Development & Testing	1	2020	4	2021
Software Upgrade Against Emerging Threats	1	2019	4	2039

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605457A *I Army Integrated Air and Missile Defense (AIAMD)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	339.051	322.263	208.938	-	208.938	130.859	63.738	33.193	94.845	0.000	1,192.887
S40: *Army Integrated Air and Missile Defense*	-	339.051	322.263	208.938	-	208.938	130.859	63.738	33.193	94.845	0.000	1,192.887

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 AMD 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 SoS 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 design in the past. The AIAMD program will provide the user with the ability to train on a single IBCS that will result in overall training savings. The AIAMD program will also provide the Army with the ability to procure components that will interface with the Integrated Fire Control Network (IFCN), alleviating the cost of procuring total system capabilities in the future.

AIAMD IOC will be delivered through the fielding of the IBCS-based AIAMD architecture including the IBCS EOC, Integrated Fire Control Network (IFCN) Relay, Sentinel, and Patriot components working in an integrated manner through the IFCN connection. The government controlled open architecture enables integration of future capabilities to meet emerging threats and fielding to Indirect Fire Protection Capability (IFPC), Air Defense Airspace Management (ADAM) Cells, ADA Brigade, Army Air and Missile Defense Command (AAMDC), and Terminal High Altitude Area Defense (THAAD).

Funding in FY 2020 supports agile software development, developmental and operational testing, culminating in a Limited User Test (LUT) in fourth quarter FY 2020. These include: completion of IBCS Qualification Testing, Logistics Demonstration, New Equipment Training development, Collective Training development and developmental testing. The LUT supports a Low Rate Initial Production Decision at Milestone C in FY 2020 consisting of both hardware in the loop and live fire events. Software development continues throughout FY 2020 to integrate additional capabilities prior to Initial Operational Capability (IOC) in FY 2022.

AIAMD is a critical component of the Army's Air and Missile Defense strategy, the Chief of Staff of the Army's number five modernization priority.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0605457A *I Army Integrated Air and Missile Defense (AIAMD)*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	336.420	277.607	200.275	-	200.275
Current President's Budget	339.051	322.263	208.938	-	208.938
Total Adjustments	2.631	44.656	8.663	-	8.663
• Congressional General Reductions	-0.252	-0.344			
• Congressional Directed Reductions	-25.000	-			
• Congressional Rescissions	-	-			
• Congressional Adds	40.000	45.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-12.117	-			
• Adjustments to Budget Years	-	-	8.663	-	8.663

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2018	FY 2019
Project: S40: *Army Integrated Air and Missile Defense*		
Congressional Add: *Counter Emerging Threat*	25.000	30.000
Congressional Add: *Cyber Security*	15.000	15.000
Congressional Add Subtotals for Project: S40	40.000	45.000
Congressional Add Totals for all Projects	40.000	45.000

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
S40: *Army Integrated Air and Missile Defense*	-	339.051	322.263	208.938	-	208.938	130.859	63.738	33.193	94.845	0.000	1,192.887
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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 AMD 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 SoS 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 design in the past. The AIAMD program will provide the user with the ability to train on a single IBCS that will result in overall training savings. The AIAMD program will also provide the Army with the ability to procure components that will interface with the Integrated Fire Control Network (IFCN), alleviating the cost of procuring total system capabilities in the future.

AIAMD IOC will be delivered through the fielding of the IBCS-based AIAMD architecture including the IBCS EOC, Integrated Fire Control Network (IFCN) Relay, Sentinel, and Patriot components working in an integrated manner through the IFCN connection. The government controlled open architecture enables integration of future capabilities to meet emerging threats and fielding to Indirect Fire Protection Capability (IFPC), Air Defense Airspace Management (ADAM) Cells, ADA Brigade, Army Air and Missile Defense Command (AAMDC), and Terminal High Altitude Area Defense (THAAD).

Funding in FY 2020 supports agile software development, developmental and operational testing, culminating in a Limited User Test (LUT) in fourth quarter FY 2020. These include: completion of IBCS Qualification Testing, Logistics Demonstration, New Equipment Training development, Collective Training development and developmental testing. The LUT supports a Low Rate Initial Production Decision at Milestone C in FY 2020 consisting of both hardware in the loop and live fire events. Software development continues throughout FY 2020 to integrate additional capabilities prior to Initial Operational Capability (IOC) in FY 2022.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Product Development ***Description:*** Product development in support of software development and developmental test phase activities. ***FY 2019 Plans:*** Provides for the continuation of software development with Patriot Radar/Launchers, Sentinel, Enduring IFPC, and initiation of agile software development efforts. Funding also provides support for developmental test activities, to include software integration testing and preparation and conduct of developmental flight test. ***FY 2020 Base Plans:*** The AIAMD Systems Engineering and Integration and Engineering Manufacturing and Development (EMD) will provide support for developmental test activities; to include software integration testing and preparation/conduct of the Limited User Test. Agile software development will continue to support future capabilities and will include software changes to defeat emerging threats. Government Furnished Equipment for EOC and Relay MEIs will be provided to EMD contractors. Government Systems Engineering and Logistics and AIAMD EMD will continue LUT NET development/Collective Training development. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease is in alignment with efforts associated with the baseline program, to include transition to a competitive agile software development process.	252.489	225.730	166.309	-	166.309
Title: Government Program Management ***Description:*** Government program management (core personnel) in support of the baseline program transitioned to Acquisition O&M effective FY 2019.	4.503	-	-	-	-
Title: Test and Evaluation ***Description:*** Test and Evaluation support for modeling and simulation, developmental test phase activities, and a Limited User Test. ***FY 2019 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	42.059	41.370	42.629	-	42.629

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Test Support for developmental test activities. Provides for preparation and conduct of the developmental flight test. ***FY 2020 Base Plans:*** Provides for continuation of Modeling and Simulation efforts at the Government Systems Integration Lab, Joint Interoperability Test Support, Army Test and Evaluation Center and White Sands Missile Range test support for developmental test activities. Provides for preparation and conduct of the Limited User Test. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase is driven by the Limited User Test and all efforts directly related to it.					
Title: FY 2019 SBIR / STTR Transfer ***FY 2019 Plans:*** FY 2019 SBIR / STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2019 SBIR / STTR Transfer	-	10.163	-	-	-
Accomplishments/Planned Programs Subtotals	299.051	277.263	208.938	-	208.938

	FY 2018	FY 2019
Congressional Add: Counter Emerging Threat ***FY 2018 Accomplishments:*** Counter Emerging Threat ***FY 2019 Plans:*** Counter Emerging Threat	25.000	30.000
Congressional Add: Cyber Security ***FY 2018 Accomplishments:*** Cyber Security ***FY 2019 Plans:*** Cyber Security	15.000	15.000
Congressional Adds Subtotals	40.000	45.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• C53101: *MSE Missile*	1,103.040	1,131.276	0.000	736.541	736.541	767.495	749.530	999.731	898.131	793.430	7,179.174

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• EF9: *System Integration and Test*	69.558	77.188	107.746	-	107.746	111.080	121.308	37.186	40.999	Continuing	Continuing
• EX2: *Lower Tier Air Missile Defense (LTAMD) Capability*	57.437	89.248	427.772	-	427.772	376.738	332.322	241.461	87.500	Continuing	Continuing
• C50016: *System Integration and Test Procurement*	136.579	105.395	0.000	113.857	113.857	105.044	107.288	86.178	87.410	Continuing	Continuing
• DU3: *IFPC2*	10.871	40.979	0.000	-	0.000	-	-	-	-	Continuing	Continuing
• EY7: *IFPC Increment 2 - Block 1*	156.361	132.283	243.228	-	243.228	101.000	58.000	45.000	5.000	Continuing	Continuing
• C62002: *IFPC INC 2-I BLOCK 1 SYSTEM*	-	31.286	0.000	9.337	9.337	241.387	446.464	424.568	446.541	0.000	1,599.583
• C62001: *IFPC Inc 2-I Block 1 Missile 1*	50.056	145.636	0.000	-	0.000	-	-	-	-	0.000	195.692
• E10: *Sentinel*	31.651	39.289	105.243	-	105.243	103.427	105.394	65.574	69.407	Continuing	Continuing
• BZ5075: *IAMD Battle Command System*	-	-	29.629	-	29.629	254.834	353.929	417.426	413.775	Continuing	Continuing
• 146: *Air & Msl Defense Planning Control Sys*	23.335	24.296	14.300	-	14.300	8.401	2.915	1.228	3.405	Continuing	Continuing
• AD5070: *AIR & MSL Defense Planning & Control Sys*	132.713	29.913	24.730	14.331	39.061	49.147	106.671	63.143	0.075	0.000	420.723
• 149: *Counter-Rockets, Artillery & Mortar*	17.250	14.844	1.277	-	1.277	0.909	-	-	-	0.000	34.280
• 0604403A: *Future Interceptor*	-	-	8.000	-	8.000	8.000	8.000	88.918	120.000	0.000	232.918
• 0604117A: *Maneuver - Short Range Air Defense (M-SHORAD)*	19.201	79.016	33.100	6.000	39.100	105.700	341.100	382.600	308.700	0.000	1,275.417
• C14300: *M-SHORAD - Procurement*	-	-	0.000	262.100	262.100	537.400	292.200	80.500	78.600	Continuing	Continuing

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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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*

D. Acquisition Strategy

The AIAMD acquisition strategy is to deliver an Initial Operational Capability (IOC) in FY 2022. The capabilities are delivered through the fielding of the IAMD Battle Command System (IBCS) based AIAMD architecture including the IBCS Engagement Operations Center (EOC), Sentinel, and Patriot (through a Radar Interface Unit (RIU)) components connected via an Integrated Fire Control Relay, working in an integrated manner. Future capabilities include the incorporation of IBCS functionality into Indirect Fire Protection Capabilities (IFPC), Air Defense Airspace Management (ADAM) Cells, ADA Brigade, Army Air and Missile Defense Command (AAMDC), Terminal High Altitude Area Defense (THAAD) batteries, and other Army and Joint net-centric architectures using an agile software development process.

Key principles of the AIAMD acquisition approach are the following:
- Migrate from system-based acquisition to competitive component-based acquisition using agile development/operations methodology IAW FY 2019 National Defense Authorization Act direction
- 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 a common Army IBCS 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 and software common configuration items
- Conduct architecture-based System Engineering, Integration and Test (SEI&T) activities for an incrementally fielded configuration of the AIAMD Integrated Fire Control Network-compatible IBCS EOC, weapons and sensor system components

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Program Management	MIPR	Various : Huntsville, AL	31.025	4.503	Oct 2017	-		-		-		-	Continuing	Continuing	Continuing
		Subtotal	31.025	4.503		-		-		-		-	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total 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	152.818	28.310	Oct 2017	23.401	Oct 2018	22.014	Oct 2019	-		22.014	Continuing	Continuing	Continuing
IAMD Engineering Manufacturing and Development	SS/ Various	Northrop Grumman, Raytheon, Lockheed Martin and Other : Huntsville, AL and Various other locations	1,119.922	205.000	Oct 2017	181.054	Oct 2018	122.295	Oct 2019	-		122.295	Continuing	Continuing	Continuing
Government Furnished Equipment	MIPR	Various : Multiple	21.101	2.876	Oct 2017	4.865	Oct 2018	4.660	Oct 2019	-		4.660	Continuing	Continuing	Continuing
Government Systems Engineering and Logistics	TBD	Various : Huntsville, AL	72.625	16.303	Oct 2017	16.410	Oct 2018	17.340	Oct 2019	-		17.340	Continuing	Continuing	Continuing
Advanced Electronic Protection Enhancement (AEPE)	Various	Various : TBD	21.000	-		-		-		-		-	0.000	21.000	-
Cyber Security	Various	Huntsville, AL : TBD	38.000	15.000	Jun 2018	15.000	Jan 2019	-		-		-	0.000	68.000	-
Counter Emerging Threat	Various	AMRDEC/Torch Technologies : Huntsville, AL	15.000	25.000	Jul 2018	30.000	Jan 2019	-		-		-	0.000	70.000	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2019 SBIR / STTR Transfer	TBD	TBD : TBD	-	-		10.163		-		-		-	0.000	10.163	-
		Subtotal	1,458.163	292.489		280.893		166.309		-		166.309	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Other Test Activities/ Army Evaluation Center/ Developmental Test Command/Operational Test Command	MIPR	Various : Multiple Locations	43.752	7.546	Jan 2018	9.769	Oct 2018	14.892	Oct 2019	-		14.892	Continuing	Continuing	Continuing
Modeling & Sim/Joint Interoperability Test Spt	MIPR	SED : Huntsville, AL	165.404	27.670	Jan 2018	23.789	Oct 2018	17.501	Oct 2019	-		17.501	Continuing	Continuing	Continuing
Range Support	MIPR	WSMR : White Sands, NM	45.027	6.843	Oct 2017	7.812	Oct 2018	10.236	Oct 2019	-		10.236	Continuing	Continuing	Continuing
		Subtotal	254.183	42.059		41.370		42.629		-		42.629	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,743.371	339.051		322.263		208.938		-		208.938	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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*

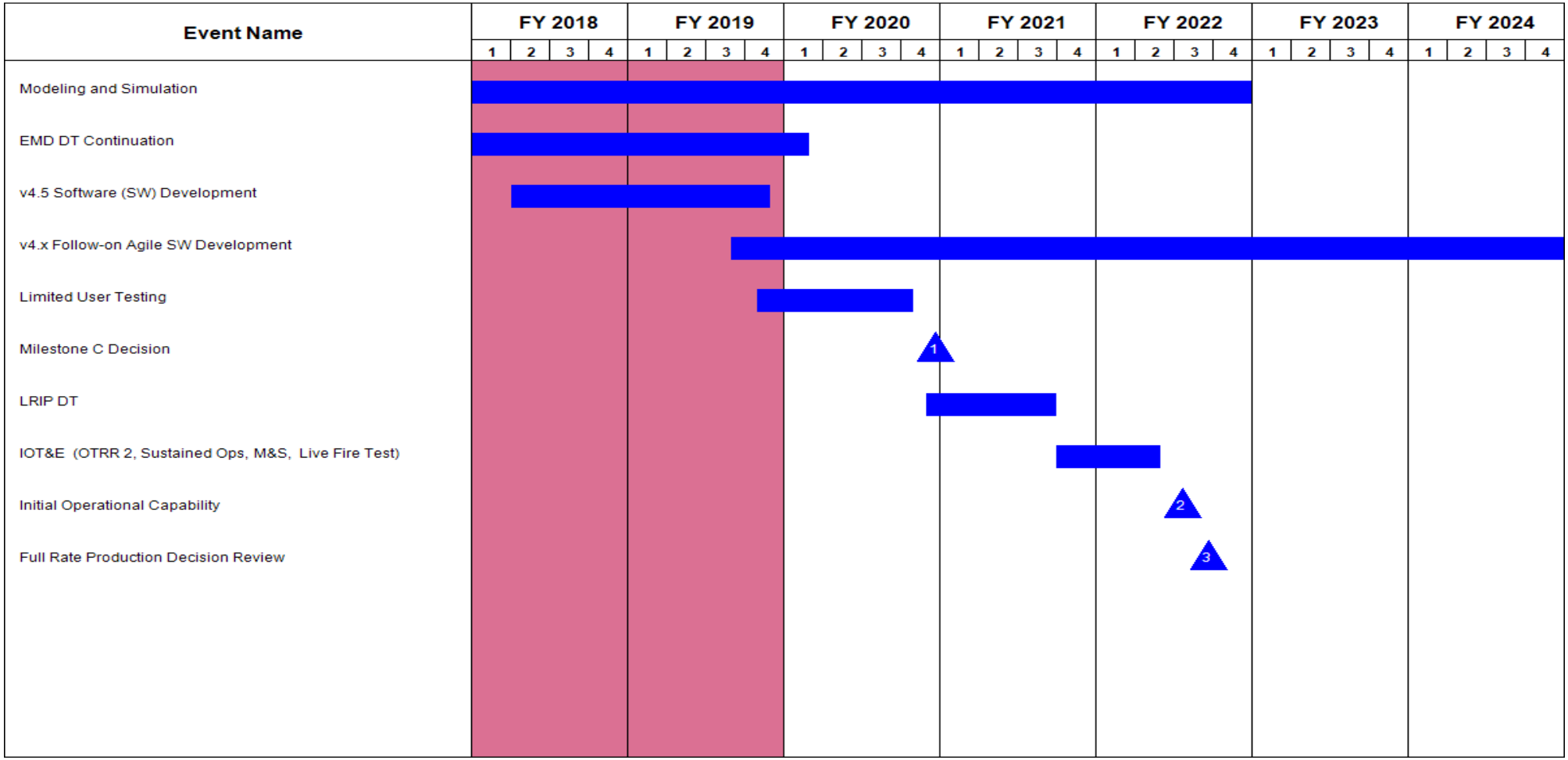

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605457A / *Army Integrated Air and Missile Defense (AIAMD)*	**Project (Number/Name)** S40 / *Army Integrated Air and Missile Defense*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Modeling and Simulation	1	2013	4	2022
EMD Developmental Test (DT)	4	2014	1	2017
EMD DT Continuation	1	2018	1	2020
v4.5 Software (SW) Development	2	2018	4	2019
v4.x Follow-on Agile SW Development	3	2019	4	2024
Limited User Testing	4	2019	4	2020
Milestone C Decision	4	2020	4	2020
LRIP DT	4	2020	3	2021
IOT&E (OTRR 2, Sustained Ops, M&S, Live Fire Test)	4	2021	2	2022
Initial Operational Capability	3	2022	3	2022
Full Rate Production Decision Review	3	2022	3	2022

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605625A *I Manned Ground Vehicle*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	0.000	0.000	378.400	-	378.400	320.100	218.700	65.700	52.300	0.000	1,035.200
CF6: *Next Generation Combat Vehicle (NGCV)*	-	0.000	0.000	378.400	-	378.400	320.100	218.700	65.700	52.300	0.000	1,035.200

Note

This is a parallel effort continued from PE 0603645A / Armored System Modernization - Adv Dev, project EV7: Combat Vehicle Prototyping.
This is a new start in FY 2020.

A. Mission Description and Budget Item Justification

The Next Generation Combat Vehicle-Optionally Manned Fighting Vehicle (NGCV-OMFV) is a purpose built manned platform that maneuvers Soldiers to a point of positional advantage to engage in close combat. It is designed to operate with or without a crew and Soldiers under armor based on the commander's decision. It delivers decisive lethality during the execution of combined arms maneuver while also controlling maneuver robotics and semi-autonomous systems. The platform will be optimized for operations in dense urban terrain and with significantly reduced logistical burdens. The vehicle will include an architecture to allow for increased capability and growth margin.

In close combat, the Optionally Manned Fighting Vehicle (OMFV) will deliver decisive lethality during the execution of combined arms maneuver. The changing character of warfare drives changes in how the Army delivers, operates, and sustains future combat capabilities. The Army's first priority is to replace the Bradley with the OMFV. The OMFV will be developed using an incremental approach to the integration of advanced lethality and sensing technologies, with focus of increment one to gain growth margins in power, weight and vehicle computing architecture as the NGCV Cross Functional Team's (CFT) first priority, followed by an Increment II to integrate weapon system, targeting and sensing technologies that are matured and qualified within Science and Technology programs. OMFV will be joined later by a purpose built Robotic Combat Vehicle (RCV) and future capability upgrades for the OMFV.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army					Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605625A / *Manned Ground Vehicle*		
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	0.000	378.400	-	378.400
Total Adjustments	0.000	0.000	378.400	-	378.400
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	378.400	-	378.400

Change Summary Explanation

This is a parallel effort continued from PE 0603645A / Armored System Modernization - Adv Dev, project EV7: Combat Vehicle Prototyping.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605625A / *Manned Ground Vehicle*	Project (Number/Name) CF6 / *Next Generation Combat Vehicle (NGCV)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
CF6: *Next Generation Combat Vehicle (NGCV)*	-	0.000	0.000	378.400	-	378.400	320.100	218.700	65.700	52.300	0.000	1,035.200
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is a parallel effort continued from PE 0603645A / Armored System Modernization - Adv Dev, project EV7: Combat Vehicle Prototyping.
This is a new start in FY 2020. This program supports the Cross Functional Team (CFT).

A. Mission Description and Budget Item Justification

The Next Generation Combat Vehicle-Optionally Manned Fighting Vehicle (NGCV-OMFV) is a purpose built manned platform that maneuvers Soldiers to a point of positional advantage to engage in close combat. It is designed to operate with or without a crew and Soldiers under armor based on the commander's decision. It delivers decisive lethality during the execution of combined arms maneuver while also controlling maneuver robotics and semi-autonomous systems. The platform will be optimized for operations in dense urban terrain and with significantly reduced logistical burdens. The vehicle will include an architecture to allow for increased capability and growth margin.

In close combat, the Optionally Manned Fighting Vehicle (OMFV) will deliver decisive lethality during the execution of combined arms maneuver. The changing character of warfare drives changes in how the Army delivers, operates, and sustains future combat capabilities. The Army's first priority is to replace the Bradley with the OMFV. The OMFV will be developed using an incremental approach to integration of advanced lethality and sensing technologies, with focus of increment one to gain growth margins in power, weight and vehicle computing architecture as the NGCV Cross Functional Team's (CFT) first priority, followed by an Increment II to integrate weapon system, targeting and sensing technologies that are matured and qualified within Science and Technology programs. OMFV will be joined later by a purpose built Robotic Combat Vehicle (RCV) and future capability upgrades for the OMFV.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Government Engineering & Program Management	-	-	25.964
Description: Provides Government System Engineering and Program Management support. Funding will cover the costs of government and direct support contractor labor, travel, training, supplies, equipment and facilities to effectively manage the NGCV-OMFV program.			
FY 2020 Plans: Provides Government System Engineering and Program Management support. Covers the costs of government and direct support contractor labor, travel, training, supplies, equipment and facilities to effectively manage the NGCV-OMFV program.			
FY 2019 to FY 2020 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605625A / *Manned Ground Vehicle*	**Project (Number/Name)** CF6 / *Next Generation Combat Vehicle (NGCV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Program Management has increased in FY 2020 due to the acceleration of the OMFV procurement strategy (Bradley replacement).			
Title: Product Development	-	-	352.436
Description: Procures NGCV-OMFV prototypes for developmental testing. Develops government/contractor logistics plans and user documentation. ***FY 2020 Plans:*** NGCV-OMFV Knowledge Point 2 (MTA Section 804 approval replaces Milestone B (MS B)) approval is scheduled for 2QFY 2020 followed by Engineering and Manufacturing Development (EMD) contract awards with up to 2 vendors providing 12 prototypes each (24 total) and test assets. Conduct start of work meeting, Design Maturity Review (DMR) and contractor/government program management reviews. Planning activities associated with delivery of prototypes and test assets in FY 2021. Concurrently, planning for logistics assessments, technical manual development, and provisioning conferences to support Contractor Logistics Support (CLS), transitioning to organic support by First Unit Equipped (FUE) in 2026. This funding will be used for Developmental Engineering, Producibility Engineering and Planning, Developmental Tooling, Prototypes, Contractor SEPM, Contractor Support to EMD Test, Training, Data, and Support Equipment Development. Leverage the Non Development Initiative (NDI) Active Protection System (APS) installation and characterization initiative to evaluate NGCV-OMFV performance with an APS solution installed. This cost includes engineering, logistics, test, and program management to continue development. Project Manager (PM) NGCV-OMFV will characterize a Non Developmental Items (NDI) and leverage Product Manager Vehicle Protection Systems (PM VPS) to develop force protection and survivability improvements to counter evolving threats. NGCV-OMFV will have increased lethality through improved target acquisition capability along with other technology upgrades and insertions (i.e. laser pointing, color camera, laser range finder, etc). PM NGCV-OMFV will leverage the XM-913 development to increase lethality, and will characterize and develop other lethality improvements to counter evolving threats. This cost includes engineering, logistics, test, and program management to continue development and maturation. The 3GEN FLIR system will be developed by Product Manager, Ground Sensors (PM GS) and will be provided to PM NGCV-OMFV as a Horizontal Technology Insertion effort. This cost includes engineering, logistics, test, and program management to continue development and technology integration. ***FY 2019 to FY 2020 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605625A / *Manned Ground Vehicle*	**Project (Number/Name)** CF6 / *Next Generation Combat Vehicle (NGCV)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Product development increases in FY 2020 to ensure that the NGCV-OMFV development program is not delayed and the Army's desired capabilities gap will be met as quickly as possible. The funding increase completes Source Selection and will be used for EMD contract award.			
Accomplishments/Planned Programs Subtotals	-	-	378.400

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• G86000: *Next Generation Combat Vehicle (NGCV)*	-	-	0.000	-	0.000	-	-	1,564.000	2,242.000	Continuing	Continuing
• 0603645A: *Armored System Modernization - Adv Dev*	41.431	84.297	157.656	-	157.656	151.624	172.864	50.703	44.700	0.000	703.275

Remarks

D. Acquisition Strategy

The NGCV-OMFV is designed to maneuver Soldiers in the Forward Operating Environment to a position of advantage to engage in close combat and deliver decisive lethality during the execution of combined arms maneuver. NGCV must exceed current capabilities while overmatching similar threat class systems. It must be optimized for dense urban areas while also defeating pacing threats on rural (open, semi-restricted and restricted) terrain and be characterized by the ability to spiral in advanced technologies as they mature. The capabilities desired focus to improve lethality, protection, mobility, range, and sustainment.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605625A / *Manned Ground Vehicle*	Project (Number/Name) CF6 / *Next Generation Combat Vehicle (NGCV)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Section 804 (x2 Vendors)	C/FFP	TBD : TBD	-	-		-		314.451	Dec 2019	-		314.451	0.000	314.451	-
Other Support Costs	Option/ FFPLOE	TBD : TBD	-	-		-		14.518		-		14.518	0.000	14.518	-
		Subtotal	-	-		-		328.969		-		328.969	0.000	328.969	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO/PEO Support	MIPR	Warren, MI : TBD	-	-		-		25.964	Dec 2019	-		25.964	0.000	25.964	-
		Subtotal	-	-		-		25.964		-		25.964	0.000	25.964	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test and Evaluation	TBD	TBD : TBD	-	-		-		23.467		-		23.467	0.000	23.467	-
		Subtotal	-	-		-		23.467		-		23.467	0.000	23.467	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		0.000		378.400		-		378.400	0.000	378.400	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605625A / *Manned Ground Vehicle*	**Project (Number/Name)** CF6 / *Next Generation Combat Vehicle (NGCV)*

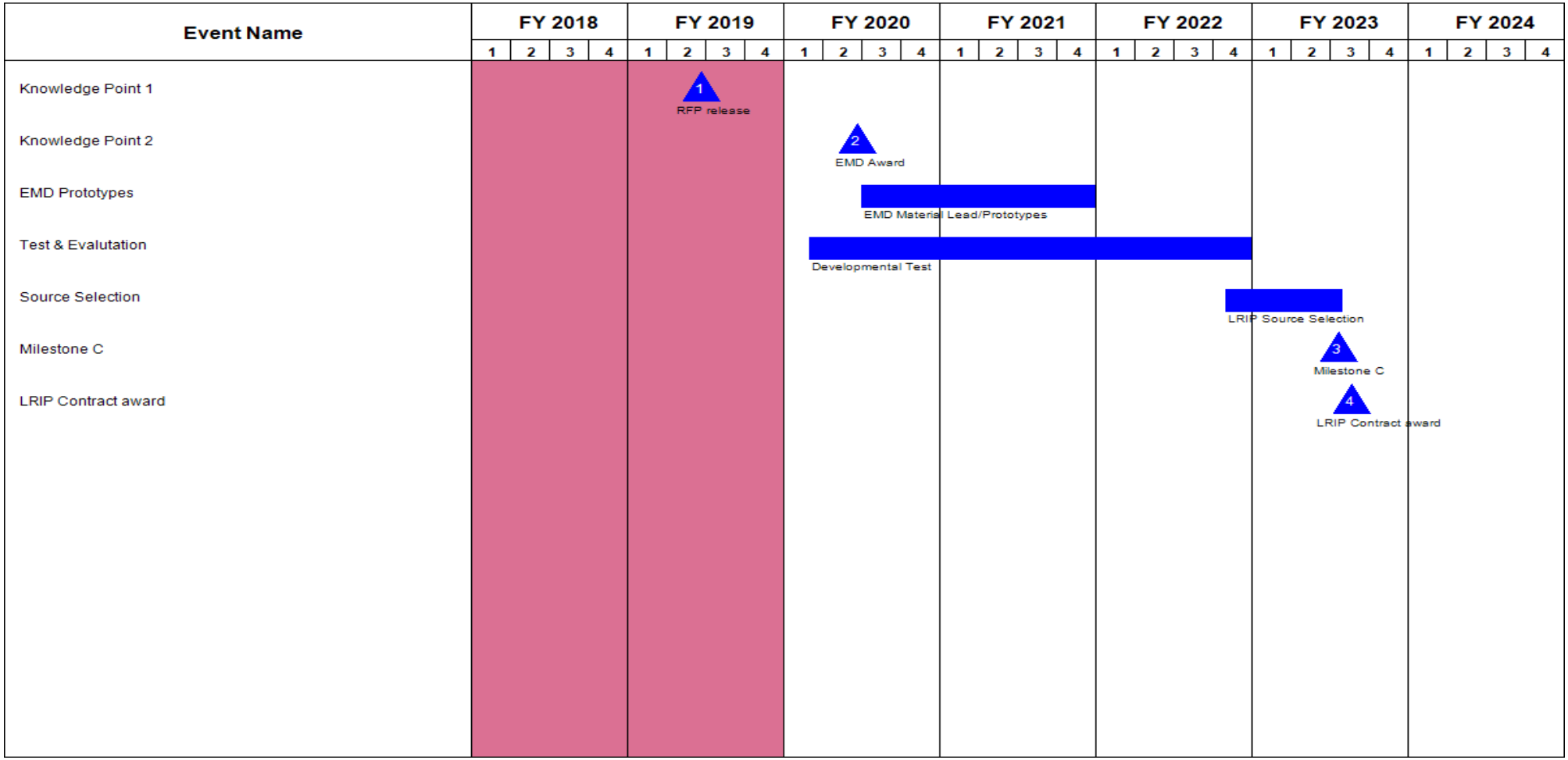

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605625A / *Manned Ground Vehicle*	**Project (Number/Name)** CF6 / *Next Generation Combat Vehicle (NGCV)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Knowledge Point 1	2	2019	2	2019
Knowledge Point 2	2	2020	2	2020
EMD Prototypes	3	2020	4	2021
Test & Evalutation	1	2020	4	2022
Source Selection	4	2022	3	2023
Milestone C	3	2023	3	2023
LRIP Contract award	3	2023	3	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605766A *I National Capabilities Integration (MIP)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	9.382	12.340	7.835	-	7.835	7.677	11.682	11.054	11.299	0.000	71.269
DX9: *National Integration To Tactical Systems(MIP)*	-	5.320	9.060	4.490	-	4.490	4.223	5.183	4.425	4.537	0.000	37.238
EX7: *Air Vigilance System Development*	-	4.062	3.280	3.345	-	3.345	3.454	6.499	6.629	6.762	0.000	34.031

Note

PE 0605766A 'National Capabilities Integration (MIP)' funds two separate efforts in two separate Projects:
(1) Project DX9 'National Integration To Tactical Systems (MIP)' provides system development research and development funds for integration of multiple projects development by Army TENCAP into enduring Programs of Record
(2) Project EX7 'Air Vigilance System Development' provides system development research and development funds to the Army's 'Air Vigilance' ACAT III Automated Information System (AIS) Program of Record (POR)

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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army					Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605766A *I National Capabilities Integration (MIP)*		
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	6.882	12.340	11.435	-	11.435
Current President's Budget	9.382	12.340	7.835	-	7.835
Total Adjustments	2.500	0.000	-3.600	-	-3.600
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	2.500	-	-3.600	-	-3.600

Change Summary Explanation

FY 2020 funding adjustment is in support of the Army's modernization priorities.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / *National Capabilities Integration (MIP)*	Project (Number/Name) DX9 / *National Integration To Tactical Systems(MIP)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
DX9: *National Integration To Tactical Systems(MIP)*	-	5.320	9.060	4.490	-	4.490	4.223	5.183	4.425	4.537	0.000	37.238
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

All funding is in support of the ACTIVE COMPONENT
Project DX9 'National Capabilities Integration (MIP)' was previously funded

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 2020 Base funding in the amount of $4.490 million provides integration funds for two (2) validated National Intel Community (IC) efforts: (1) Army TNG Integration, $3.088 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) TENCAP Radio Frequency Exploitation (TRFE), $1.402 million funds the system development and integration efforts on the prototype kit.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Army TNG Integration - Airborne Overhead Cooperative Operations (AOCO) / Theater Net-Centric Geolocation (TNG)	2.820	3.024	3.088
Description: National Intelligence Community (IC) standard for interoperability and use of specific intelligence networked capabilities.			
FY 2019 Plans: Provide 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 2020 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** DX9 / *National Integration To Tactical Systems(MIP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Continue to provide 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 to FY 2020 Increase/Decrease Statement:*** Funding increase to support 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:*** Provide 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 2019 to FY 2020 Increase/Decrease Statement:*** Fiscal Year (FY) 2020 funding adjustment to support the Army's modernization priorities in support of the National Defense Strategy.	-	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 2020 Plans:*** Continue integration of TRFE cognitive, software-based, SIGINT-Enabled, Electronic-Warfare-and-Cyber-Attack prototype capability focused on countering Peer-State and modern communication targets and threats. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	-	2.536	1.402

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** DX9 / *National Integration To Tactical Systems(MIP)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Aligns funds for system development and integration of TENCAP Radio Frequency Exploitation (TRFE) efforts ready for transition.			
Title: Remote Ground Terminal (RGT) ***Description:*** Remote Ground Terminal (RGT) is a tactical ground station that downlinks commercial satellite imagery and processes it into NSG standard formats utilizing a common processor Direct Downlink. RGT is scalable, additional sensors can be added without increasing the tactical footprint.	2.500	-	-
Accomplishments/Planned Programs Subtotals	5.320	9.060	4.490

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 0603766A: *Tactical Electronic Surveillance System - Adv Dev*	27.733	35.667	34.890	-	34.890	26.257	29.299	31.285	33.987	0.000	219.118

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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** DX9 / *National Integration To Tactical Systems(MIP)*

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / *National Capabilities Integration (MIP)*	Project (Number/Name) DX9 / *National Integration To Tactical Systems(MIP)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TNG Engineers	MIPR	Multiple : Multiple	-	0.420	Jan 2018	0.913	Jan 2019	0.115	Jan 2020	-		0.115	0.000	1.448	Continuing
		Subtotal	-	0.420		0.913		0.115		-		0.115	0.000	1.448	N/A

Remarks

Activities for AV POR realign to Project EX7 in FY 2018.

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TNG for Multiple Army PORs	MIPR	Multiple : Multiple	26.973	1.905	Jan 2018	4.782	Jan 2019	2.250	Jan 2020	-		2.250	0.000	35.910	Continuing
TRFE	MIPR	Classified : Classified	-	-		2.336	Jan 2019	1.100	Jan 2020	-		1.100	0.000	3.436	Continuing
RGT	MIPR	Army Geospatial Center : Fort Belvoir	-	2.500	May 2018	-		-		-		-	0.000	2.500	-
		Subtotal	26.973	4.405		7.118		3.350		-		3.350	0.000	41.846	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TNG Support Costs	Allot	PEO IEW&S/PM SAI : Aberdeen Proving Grounds, MD	-	0.240	Jan 2018	0.554	Jan 2019	0.550	Jan 2020	-		0.550	0.000	1.344	Continuing
		Subtotal	-	0.240		0.554		0.550		-		0.550	0.000	1.344	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / *National Capabilities Integration (MIP)*	Project (Number/Name) DX9 / *National Integration To Tactical Systems(MIP)*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
TNG Test and Evaluation	MIPR	Multiple : Multiple	-	0.255	Jan 2018	0.275	Jan 2019	0.275	Jan 2020	-		0.275	0.000	0.805	Continuing
TRFE	MIPR	Classified : Classified	-	-		0.200	Jan 2019	0.200	Jan 2020	-		0.200	0.000	0.400	Continuing
		Subtotal	-	0.255		0.475		0.475		-		0.475	0.000	1.205	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	26.973	5.320		9.060		4.490		-		4.490	0.000	45.843	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** DX9 / *National Integration To Tactical Systems(MIP)*

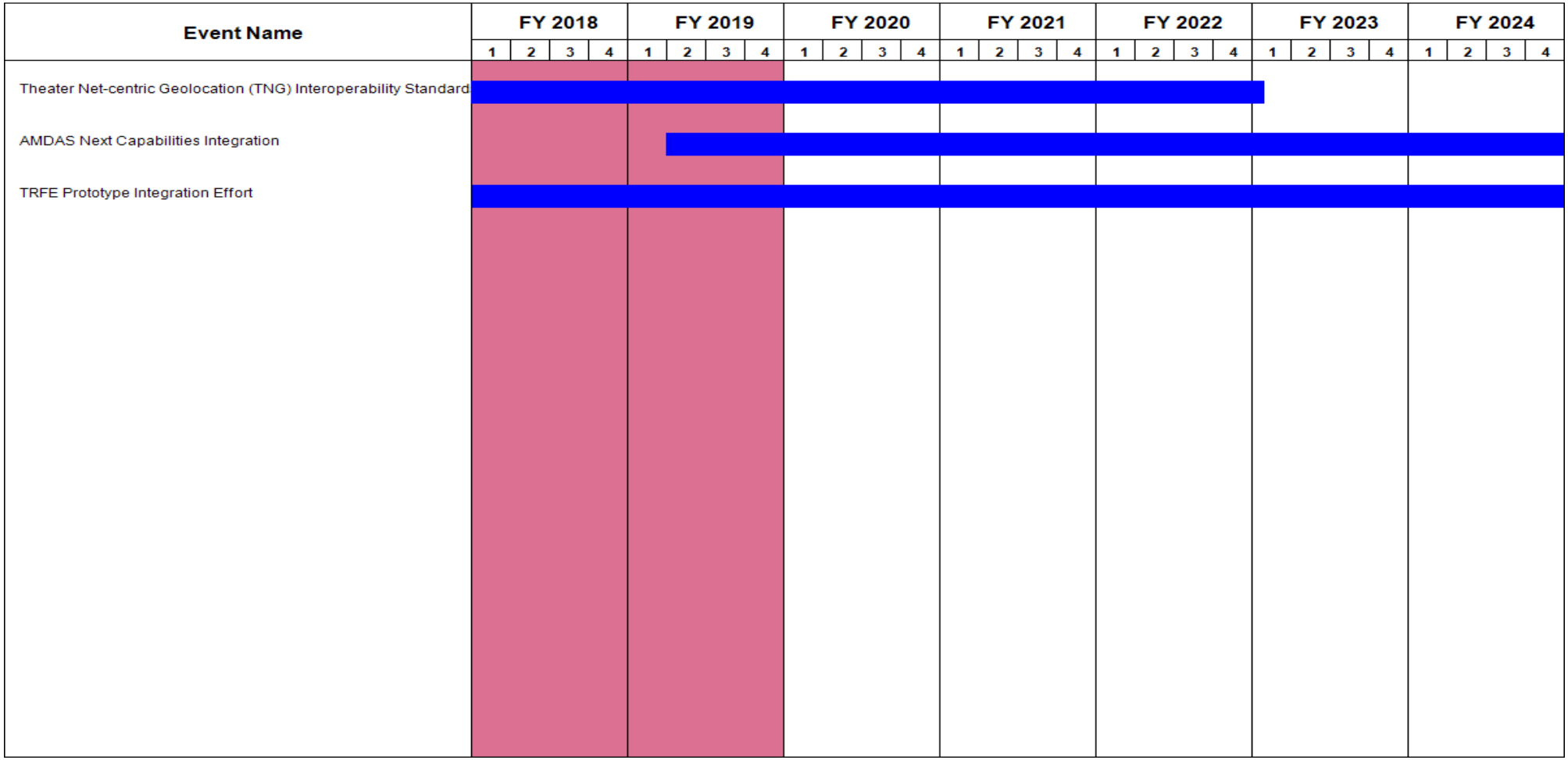

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** DX9 / *National Integration To Tactical Systems(MIP)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Theater Net-centric Geolocation (TNG) Interoperability Standards	2	2014	1	2023
AMDAS Next Capabilities Integration	2	2019	4	2024
TRFE Prototype Integration Effort	1	2018	4	2024

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / *National Capabilities Integration (MIP)*	Project (Number/Name) EX7 / *Air Vigilance System Development*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EX7: *Air Vigilance System Development*	-	4.062	3.280	3.345	-	3.345	3.454	6.499	6.629	6.762	0.000	34.031
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

All funding is in support of the ACTIVE COMPONENT
Project EX7 'Air Vigilance System Development' was previously funded

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 2020 Base funding in the amount of $3.345 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 2018	FY 2019	FY 2020
Title: Air Vigilance System Development and Integration	4.062	3.280	3.345
Description: Software and hardware engineering, development and integration efforts. ***FY 2019 Plans:*** Provide 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 2020 Plans:*** Will provide 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 to FY 2020 Increase/Decrease Statement:*** System development driven by and in response to collected sensor data.			
Accomplishments/Planned Programs Subtotals	4.062	3.280	3.345

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** EX7 / *Air Vigilance System Development*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• 0603766A: *Tactical Electronic Surveillance System - Adv Dev*	27.733	35.667	34.890	-	34.890	26.257	29.299	31.285	33.987	0.000	219.118
• W60001: *Air Vigilance (AV) (MIP)*	5.348	8.497	8.953	-	8.953	8.169	8.530	8.701	8.875	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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / *National Capabilities Integration (MIP)*	Project (Number/Name) EX7 / *Air Vigilance System Development*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Engineers and Technical Assistance (SETA)	Option/ CPAF	Perspecta : Alexandria, VA	-	0.480	Feb 2018	0.510	Jan 2019	0.530	Jan 2020	-		0.530	0.000	1.520	Continuing
		Subtotal	-	0.480		0.510		0.530		-		0.530	0.000	1.520	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Vigilance software updates and integration	MIPR	Classified : Classified	-	2.588	Jan 2018	1.825	Jan 2019	1.865	Jan 2020	-		1.865	0.000	6.278	Continuing
		Subtotal	-	2.588		1.825		1.865		-		1.865	0.000	6.278	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total 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	Nov 2017	0.830	Dec 2018	0.850	Dec 2019	-		0.850	0.000	2.424	Continuing
		Subtotal	-	0.744		0.830		0.850		-		0.850	0.000	2.424	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Air Vigilance system Testing and Exercises	MIPR	Classified : Classified	-	0.250	Jan 2018	0.115	Jan 2019	0.100	Jan 2020	-		0.100	0.000	0.465	-
		Subtotal	-	0.250		0.115		0.100		-		0.100	0.000	0.465	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605766A / *National Capabilities Integration (MIP)*	Project (Number/Name) EX7 / *Air Vigilance System Development*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	4.062		3.280		3.345		-		3.345	0.000	10.687	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** EX7 / *Air Vigilance System Development*

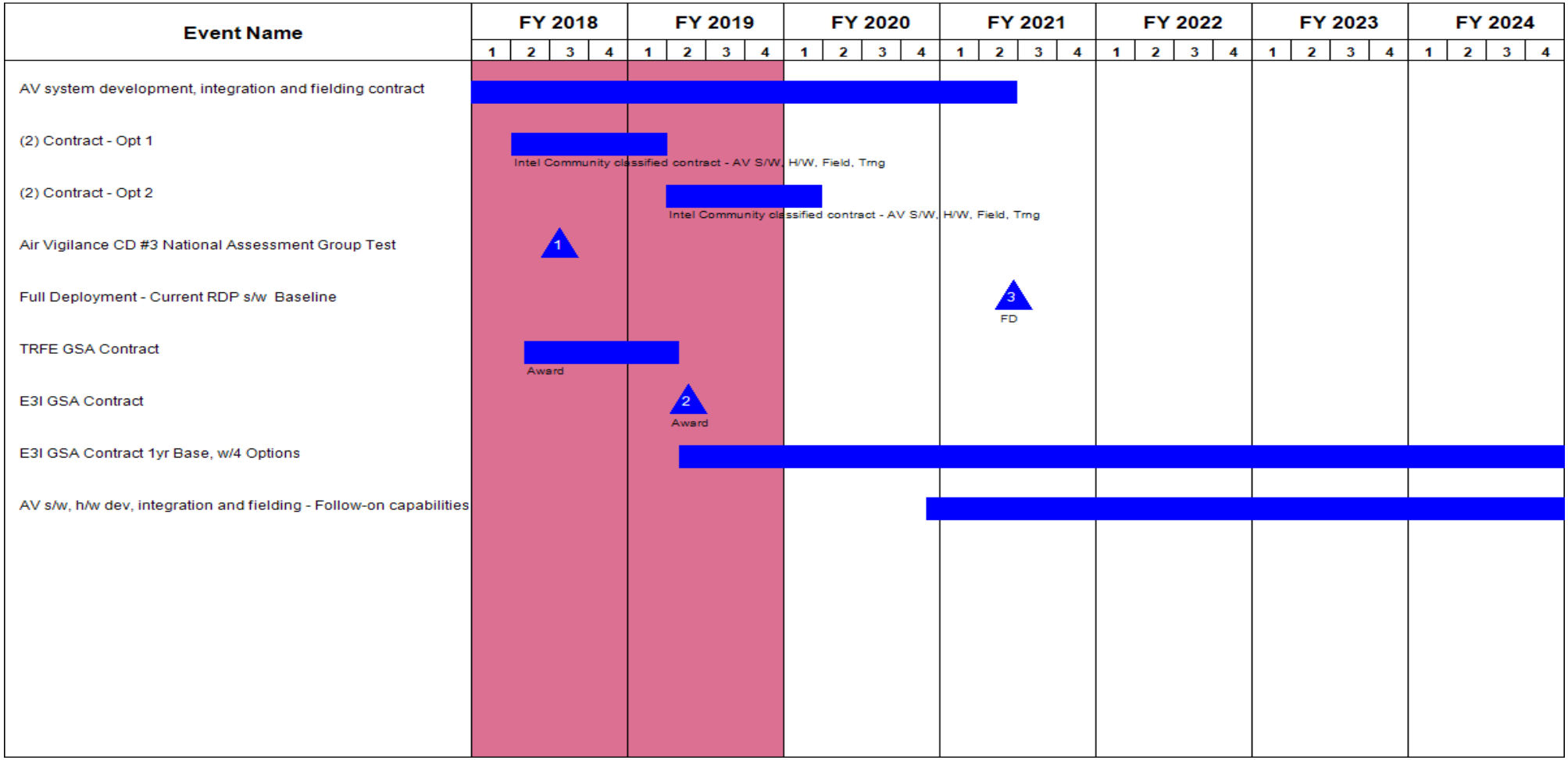

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605766A / *National Capabilities Integration (MIP)*	**Project (Number/Name)** EX7 / *Air Vigilance System Development*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
(Cont.) (1) AV system development and integration	1	2016	1	2016
AV system development, integration and fielding contract	2	2016	2	2021
(2) Contract - Opt 1	2	2018	1	2019
(2) Contract - Opt 2	2	2019	1	2020
Air Vigilance CD #3 National Assessment Group Test	3	2018	3	2018
Full Deployment - Current RDP s/w Baseline	2	2021	2	2021
TRFE GSA Contract	2	2018	2	2019
E3I GSA Contract	2	2019	2	2019
E3I GSA Contract 1yr Base, w/4 Options	2	2019	2	2025
AV s/w, h/w dev, integration and fielding - Follow-on capabilities	4	2020	1	2026

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605812A *I Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	22.530	0.000	2.732	-	2.732	1.744	1.801	1.835	2.010	Continuing	Continuing
VU9: *Joint Light Tactical Vehicle*	-	22.530	0.000	2.732	-	2.732	1.744	1.801	1.835	2.010	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

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.

Funding supports modernization of the current Tactical Wheeled Vehicle fleets by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Victory Architecture, autonomous operations and other emerging technologies. Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

Major FY20 budget activities include evaluation and assessment to improve reliability, reduce operational and sustainment (O&S) costs, or provide incremental upgrades to the base platform. These include: Li-Ion based technologies and mainstream DoD efforts to optimize the JLTV energy storage system architecture and drastically reduce (O&S) costs; acoustic and thermal signature mitigation technologies; Command, Control, Communications, Computers, and Intelligence (C4I) system packaging optimization efforts; integration of future weapon systems (i.e. Howitzer M119A3); integration of Ground Base Air Defense (GBAD), assured Positioning Navigation and Timing (PNT), Handheld Manpack and Small Form Fit (HMS) Block 2, Mounted Family of Computer Systems (MFoCS); tire solutions that provide more robust sidewalls while also providing optimal tire deflection; and Training Aids, Devices, Simulators and Simulation (TADSS).

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army					Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0605812A *I Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*		
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	23.467	2.686	2.732	-	2.732
Current President's Budget	22.530	0.000	2.732	-	2.732
Total Adjustments	-0.937	-2.686	0.000	-	0.000
• Congressional General Reductions	-0.019	-			
• Congressional Directed Reductions	-	-2.686			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.918	-			

Change Summary Explanation

FY 2018 funding rescission of $5.677M. FY 2018 final enacted budget amount is $16.853M. FY19 - $2.686M congressional reduction due to funding being excess to need

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	Project (Number/Name) VU9 / *Joint Light Tactical Vehicle*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
VU9: *Joint Light Tactical Vehicle*	-	22.530	0.000	2.732	-	2.732	1.744	1.801	1.835	2.010	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

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.

Funding supports modernization of the current Tactical Wheeled Vehicle fleets by investigating technology insertions including, but not limited to: condition based maintenance, vetronics, Victory Architecture, autonomous operations and other emerging technologies. Funding also supports developing initial prototypes to enable refinement of Operational Requirements and early user feedback to support future sustainment and operational movement operating concepts.

Major FY20 budget activities include evaluation and assessment to improve reliability, reduce operational and sustainment (O&S) costs, or provide incremental upgrades to the base platform. These include: Li-Ion based technologies and mainstream DoD efforts to optimize the JLTV energy storage system architecture and drastically reduce (O&S) costs; acoustic and thermal signature mitigation technologies; Command, Control, Communications, Computers, and Intelligence (C4I) system packaging optimization efforts; integration of future weapon systems (i.e. Howitzer M119A3); integration of Ground Base Air Defense (GBAD), assured Positioning Navigation and Timing (PNT), Handheld Manpack and Small Form Fit (HMS) Block 2, Mounted Family of Computer Systems (MFoCS); tire solutions that provide more robust sidewalls while also providing optimal tire deflection; and Training Aids, Devices, Simulators and Simulation (TADSS).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Joint Light Tactical Vehicles (JLTV) matrix management and travel support ***Description:*** Funding is provided for the support of program management government operations.	1.281	-	-
Title: Test and Evaluation Events and Analysis ***Description:*** Test and Evaluation Events	8.096	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	**Project (Number/Name)** VU9 / *Joint Light Tactical Vehicle*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Evaluation and Assessment of current and future engineering efforts ***Description:*** Funding is provided for the support of JLTV evaluation and assessment of current and future engineering efforts. ***FY 2020 Plans:*** Continuation of engineering efforts such as: Li-Ion based technologies and mainstream DoD efforts to optimize the JLTV energy storage system architecture and drastically reduce (O&S) costs; acoustic and thermal signature mitigation technologies; Command, Control, Communications, Computers, and Intelligence (C4I) system packaging optimization efforts; integration of future weapon systems (i.e. Howitzer M119A3); integration of Ground Base Air Defense (GBAD), assured Positioning Navigation and Timing (PNT), Handheld Manpack and Small Form Fit (HMS) Block 2, Mounted Family of Computer Systems (MFoCS); tire solutions that provide more robust sidewalls while also providing optimal tire deflection; and Training Aids, Devices, Simulators and Simulation (TADSS). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase in funding due to FY19 R&D Congressional Mark reduction to zero.	7.476	-	2.732
Title: FY 2018 Rescission ***Description:*** FY 2018 Rescission	5.677	-	-
Accomplishments/Planned Programs Subtotals	22.530	-	2.732

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• D15603: *JOINT LIGHT TACTICAL VEHICLE*	834.440	1,279.437	996.007	-	996.007	1,096.958	1,096.862	1,096.787	1,096.571	0.000	7,497.062

Remarks

FY 2018 Enacted Budget is $810.050M.
JLTV is a Joint Program with the United States Marine Corps (USMC)

Marine Corps Ground Combat/Support Systems, Production 5095 - FY18: 233,439 FY19: 599,274 FY20: 558,107 FY21: 484,337 FY22: 441,728 FY23: 423,591 FY24: 432,023
Marine Corps Ground Combat/Support Systems, RDTE Project 3209 0605813M - FY18: 19,467 FY19: 0 FY20: 2,105 FY21: 0 FY22: 0 FY23: 0 FY24: 0

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	**Project (Number/Name)** VU9 / *Joint Light Tactical Vehicle*

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 to support fielding to U.S. Army and USMC units once the FRP decision is achieved and allow the program to transition into FRP.

In support of a FRP decision, by the end of March 2019, the Program Manager (PM) is to provide test vehicles to Army Futures Command (AFC) and Army Test and Evaluation Command (ATEC) for evaluation of situational awareness optimal solution sets to include larger door windows with and without camera mix. Improvements for noise reductions both internal and external, to include mufflers, alternator isolation and new design on gears for gear box, trans-axle and wheel ends are desired to be included with soldier feedback assessment with situational awareness. Additionally, the PM is to provide a cost estimate for troop seats to include automotive style seat belts with integrated roll-over protection. United States Army Training and Doctrine Command (TRADOC) is tasked to review requirements for JLTV trailer to specified type units. Decision brief on JLTV performance improvements is to be provided to senior leaders no later than May 2019.

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. The JLTV program will look for opportunities to implement increased capabilities throughout the systems Life Cycle.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	**Project (Number/Name)** VU9 / *Joint Light Tactical Vehicle*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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 and Operations and Maintenance - Army(OMA).

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
JLTV Live Fire Test Support	C/FFP	Oshkosh Corporation : Oshkosh, WI	19.091	-		-		-		-		-	0.000	19.091	-
Evaluation and Assessment of current and future engineering efforts	C/TBD	To Be Determined : To Be Determined	-	7.476	Jun 2019	-		2.732	Jan 2020	-		2.732	Continuing	Continuing	Continuing
		Subtotal	19.091	7.476		-		2.732		-		2.732	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.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	Project (Number/Name) VU9 / *Joint Light Tactical Vehicle*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2018 includes troop seats Evaluation and Assessment for JLTV performance improvements to obtain FRP approval.															

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Joint Light Tactical Vehicles (JLTV) Program Management Support	Various	TACOM Life Cycle Management Command (LCMC), : Harrison Township, MI	31.570	0.349	Sep 2018	-		-		-		-	0.000	31.919	-
GFE Management / GFE / Integration	MIPR	Various : TBD	18.504	0.932	Sep 2018	-		-		-		-	0.000	19.436	-
JLTV EMD/LRIP phase.	MIPR	Tank-Automotive Research, Development, and Engineering Center - TARDEC : Warren, MI	14.245	-		-		-		-		-	0.000	14.245	-
JLTV Prototype EMD/LRIP - Budget	MIPR	TACOM Life Cycle Management Command (LCMC), : Warren, MI	12.383	-		-		-		-		-	0.000	12.383	-
		Subtotal	76.702	1.281		-		-		-		-	0.000	77.983	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 and Operations and Maintenance - Army (OMA).

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	Project (Number/Name) VU9 / *Joint Light Tactical Vehicle*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
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 - Log demo, and corrosion.	Various	TBD : Various	34.898	8.096		-		-		-		-	0.000	42.994	-
FY 2018 Rescission	TBD	N/A : N/A	-	5.677		-		-		-		-	0.000	5.677	-
		Subtotal	76.240	13.773		-		-		-		-	0.000	90.013	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	183.015	22.530		0.000		2.732		-		2.732	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	**Project (Number/Name)** VU9 / *Joint Light Tactical Vehicle*

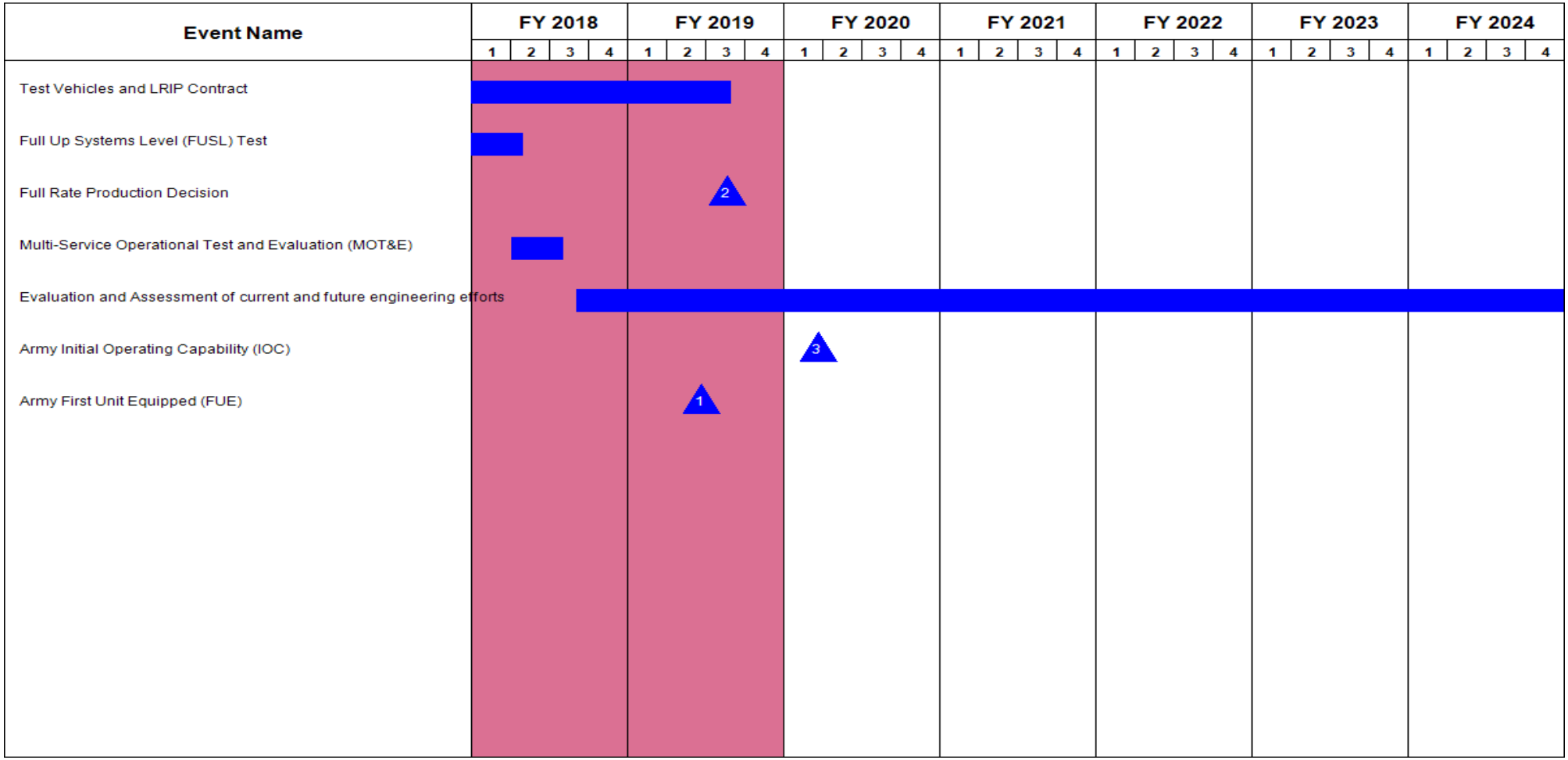

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605812A / *Joint Light Tactical Vehicle (JLTV) Engineering and Manufacturing Development Phase (EMD)*	**Project (Number/Name)** VU9 / *Joint Light Tactical Vehicle*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Test Vehicles and LRIP Contract	4	2015	3	2019
Full Up Systems Level (FUSL) Test	2	2017	1	2018
Full Rate Production Decision	3	2019	3	2019
Multi-Service Operational Test and Evaluation (MOT&E)	2	2018	3	2018
Evaluation and Assessment of current and future engineering efforts	3	2018	4	2024
Army Initial Operating Capability (IOC)	1	2020	1	2020
Army First Unit Equipped (FUE)	2	2019	2	2019

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0605830A *I Aviation Ground Support Equipment*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	6.653	7.703	1.664	-	1.664	1.468	1.386	1.334	1.162	0.000	21.370
EE5: *Aviation Ground Support Equipment*	-	6.653	7.703	1.664	-	1.664	1.468	1.386	1.334	1.162	0.000	21.370

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), Pitot Static Test Set (PSTS), Aviation Ground Power Unit Next Generation (AGPU Nex Gen), Modernized Flexible Engine Diagnostic System (MFEDS), Modernized Maintenance Stands (MMS), and development of support equipment required for maintenance of modernized/future force aircraft.

B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	6.930	2.706	5.430	-	5.430
Current President's Budget	6.653	7.703	1.664	-	1.664
Total Adjustments	-0.277	4.997	-3.766	-	-3.766
• Congressional General Reductions	-0.006	-0.003			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	5.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.271	-			
• Adjustments to Budget Years	-	-	-3.766	-	-3.766

Change Summary Explanation

FY 2020 budget adjustment of -$3.766 million from the President's Budget 2019 submission was in support of Army modernization priorities.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EE5: *Aviation Ground Support Equipment*	-	6.653	7.703	1.664	-	1.664	1.468	1.386	1.334	1.162	0.000	21.370
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project 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), Pitot Static Test Set (PSTS), Aviation Ground Power Unit Next Generation (AGPU Nex Gen), Modernized Flexible Engine Diagnostic System (MFEDS), Modernized Maintenance Stands (MMS), and development of support equipment required for maintenance of modernized/future force aircraft.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020
Title: Tool Set, Aviation Unit Maintenance ***Description:*** The Tool Set, Aviation Unit Maintenance consists of three deployable shelters which provide tool loads required for unit-level aviation maintenance tasks.	0.710	-	-
Title: SCAMP II, Type 2 (Expeditionary Variant) ***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. ***FY 2019 Plans:*** Conduct Customer Test and Logistics Demonstration/Tech Manual Verification. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Will complete Customer Test and Logistics Demonstration/Tech Manual Verification in FY19.	0.568	0.400	-
Title: Pitot Static Test Set (PSTS) ***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.	-	1.175	0.824

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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 2018	FY 2019	FY 2020
FY 2019 Plans: Conduct Acceptance Tests and Airworthiness Release and Safety Conformation. ***FY 2020 Plans:*** Conduct logistics demonstrations, verify tech manual and develop TDP. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** The logistics demonstration and tech manual verification require less resources than the Acceptance Tests and Airworthiness Release efforts.			
Title: Aviation Ground Power Unit Next Generation (AGPU Next Gen) ***Description:*** The AGPU Next Gen provides external hydraulic, pneumatic, and AC/DC electrical power to meet Army helicopter servicing requirements. ***FY 2019 Plans:*** Conduct testing of the AGPU Next Gen to secure an Airworthiness requirements memoradum. ***FY 2020 Plans:*** Begin the Initial Operational Test and Evaluation (IOT&E) of the AGPU Next Gen candidates. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase is due to the transition to start the qualification process of the Next Generation Aviation Ground Power Unit.	4.226	0.541	0.840
Title: Modernized Flexible Engine Diagnostic System (MFEDS) ***Description:*** The MFEDS is an advanced technology engine test system designed to test and verify flight readiness of engines removed from aircraft for maintenance.	0.045	-	-
Title: Modernized Maintenacne Stand (MMS) ***Description:*** The Modernized Maintenance Stand provides a stable work platform for aircraft maintainers from ground level to the rotor systems. It enhances the occupational safety environment during scheduled and unscheduled maintenance operations.	0.124	-	-
Title: Next Generation Health Monitoring System ***Description:*** Congressional increase fo the Next Generation Health Monitoring System was placed on the wrong budget line. This PE Project does not fund this effort. ***FY 2019 Plans:***	-	5.000	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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 2018	FY 2019	FY 2020
None ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY2019 funding reflects a Congressional increase that was placed on the wrong line. This Budget Line does not procure Next Generation Health Monitoring Systems.			
Title: Management Support Services ***Description:*** Management Support Services in support of the Aviation Ground Support Equipment Product Management Office.	0.609	-	-
Title: Technical Engineering Services ***Description:*** Technical Engineering Services in support of Airworthiness and Safety certifications for Aviation Ground Support Equipment. ***FY 2019 Plans:*** Continue Technical Engineering Services ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease due to Technical Enginnering Services spread between the programs.	0.371	0.500	-
Title: FY2019 SBIR/STTR Transfer ***Description:*** FY2019 SBIR STTR Transfer ***FY 2019 Plans:*** FY2019 SBIR STTR Transfer ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY2019 SBIR STTR Transfer	-	0.087	-
Accomplishments/Planned Programs Subtotals	6.653	7.703	1.664

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• AZ3520: *AVIATION GROUND SUPPORT EQUIPMENT*	47.404	34.818	18.624	-	18.624	18.825	16.121	16.455	17.429	0.000	169.676

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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*

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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Management Support Services	Various	PM AGSE : Redstone Arsenal, AL	0.977	0.609	Oct 2018	-		-		-		-	0.000	1.586	-
FY2019 SBIR STTR Transfer	TBD	HQDA : Washington D.C.	-	-		0.087	Oct 2018	-		-		-	0.000	0.087	-
		Subtotal	0.977	0.609		0.087		-		-		-	0.000	1.673	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Tool Set, Aviation Unit Maintenance	Various	AMRDEC, RSA; RTTC, RSA; Aberdeen Test Center, : Aberdeen Proving Ground, MD	4.591	0.710	Aug 2018	-		-		-		-	0.000	5.301	-
SCAMP II, Type 2 (Expeditionary)	Various	AMCOM, RSA; AMRDEC, RSA : Redstone Arsenal, AL	1.178	0.568	Nov 2019	0.400	Feb 2019	-		-		-	0.000	2.146	-
PSTS	C/TBD	To Be Determined : To Be Determined	-	-		1.175	Apr 2019	0.824	Apr 2020	-		0.824	Continuing	Continuing	Continuing
AGPU Next Gen.	PO	RTC : Redstone Arsenal, AL	-	4.226	Aug 2018	0.541	Jun 2019	0.840	May 2020	-		0.840	Continuing	Continuing	Continuing
Modernized Maintenance Stand	MIPR	ATEC : Redstone Arsenal	-	0.124	Jun 2018	-		-		-		-	0.000	0.124	-
Modernized Flexible Diangnostic System	MIPR	RTC : Redstone Arsenal	-	0.045	May 2018	-		-		-		-	0.000	0.045	-
Next Generation Health Monitoring System	TBD	To Be Determined : To Be Determined	-	-		5.000	Dec 2018	-		-		-	0.000	5.000	-
		Subtotal	5.769	5.673		7.116		1.664		-		1.664	Continuing	Continuing	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Technical Engineering Services	MIPR	AATD : Ft. Eustis, VA	0.756	0.221	Apr 2018	0.500		-		-		-	0.000	1.477	-
Technical Engineering Services	MIPR	AED : Redstone Arsenal, AL	0.347	0.150	Apr 2018	-		-		-		-	0.000	0.497	-
		Subtotal	1.103	0.371		0.500		-		-		-	0.000	1.974	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	7.849	6.653		7.703		1.664		-		1.664	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
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*

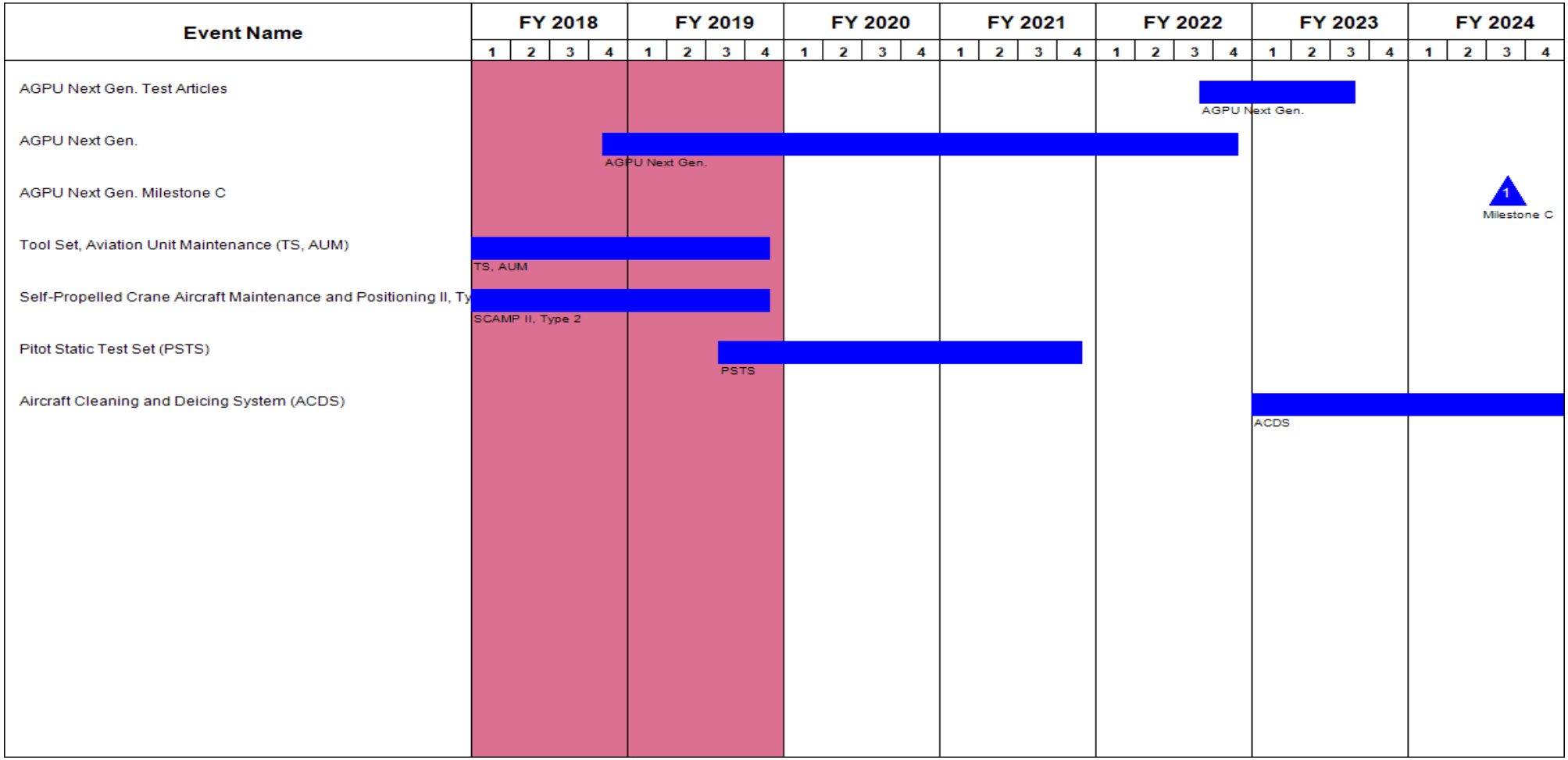

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0605830A / *Aviation Ground Support Equipment*	**Project (Number/Name)** EE5 / *Aviation Ground Support Equipment*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
AGPU Next Gen. Test Articles	3	2022	3	2023
AGPU Next Gen.	4	2018	4	2022
AGPU Next Gen. Milestone C	3	2024	3	2024
Tool Set, Aviation Unit Maintenance (TS, AUM)	4	2016	4	2019
Self-Propelled Crane Aircraft Maintenance and Positioning II, Type 2	3	2015	4	2019
Pitot Static Test Set (PSTS)	3	2019	4	2021
Aircraft Cleaning and Deicing System (ACDS)	1	2023	4	2024

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0210609A *I Paladin Integrated Management (PIM)*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	5.868	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.868
ED8: *Paladin Integrated Management (PIM)*	-	5.868	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.868

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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	6.112	0.000	0.000	-	0.000
Current President's Budget	5.868	0.000	0.000	-	0.000
Total Adjustments	-0.244	0.000	0.000	-	0.000
• Congressional General Reductions	-0.005	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.239	-			

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0210609A / *Paladin Integrated Management (PIM)*	Project (Number/Name) ED8 / *Paladin Integrated Management (PIM)*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
ED8: *Paladin Integrated Management (PIM)*	-	5.868	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	5.868
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

No funding for Program element after FY 2018.

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 2018	FY 2019	FY 2020
Title: Paladin/FAASV Integrated Management (PIM) Development ***Description:*** Funding is provided for the following contractor developmental efforts:	1.755	-	-
Title: Program Management ***Description:*** Funding is provided for the following program management support	1.335	-	-
Title: Training ***Description:*** Funding is provided for the following training government and contractor efforts	2.778	-	-
Accomplishments/Planned Programs Subtotals	5.868	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0210609A / *Paladin Integrated Management (PIM)*	**Project (Number/Name)** ED8 / *Paladin Integrated Management (PIM)*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• GZ0410: *Paladin Integrated Management (PIM)*	772.149	525.902	553.425	-	553.425	506.698	512.529	593.001	620.227	3,444.770	7,528.701

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, 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.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0210609A / *Paladin Integrated Management (PIM)*	Project (Number/Name) ED8 / *Paladin Integrated Management (PIM)*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total 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	10.401	2.778	Nov 2017	-		-		-		-	0.000	13.179	-
PIM Development-Government	MIPR	Various OGAs : Various	34.414	1.755	Dec 2018	-		-		-		-	0.000	36.169	-
PIM Development-Contractor	SS/CPIF	BAE Systems : York, PA	123.406	-		-		-		-		-	0.000	123.406	-
		Subtotal	169.736	4.533		-		-		-		-	0.000	174.269	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PMO/PEO Support	MIPR	PM/PEO Paladin/FAASV : Picatinny	19.135	1.335	Jul 2018	-		-		-		-	0.000	20.470	-
		Subtotal	19.135	1.335		-		-		-		-	0.000	20.470	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
System Level Testing	MIPR	Various OGAs : Various	64.594	-		-		-		-		-	0.000	64.594	-
		Subtotal	64.594	-		-		-		-		-	0.000	64.594	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	253.465	5.868		0.000		-		-		-	0.000	259.333	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0210609A / *Paladin Integrated Management (PIM)*	Project (Number/Name) ED8 / *Paladin Integrated Management (PIM)*	

	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0210609A / *Paladin Integrated Management (PIM)*	**Project (Number/Name)** ED8 / *Paladin Integrated Management (PIM)*

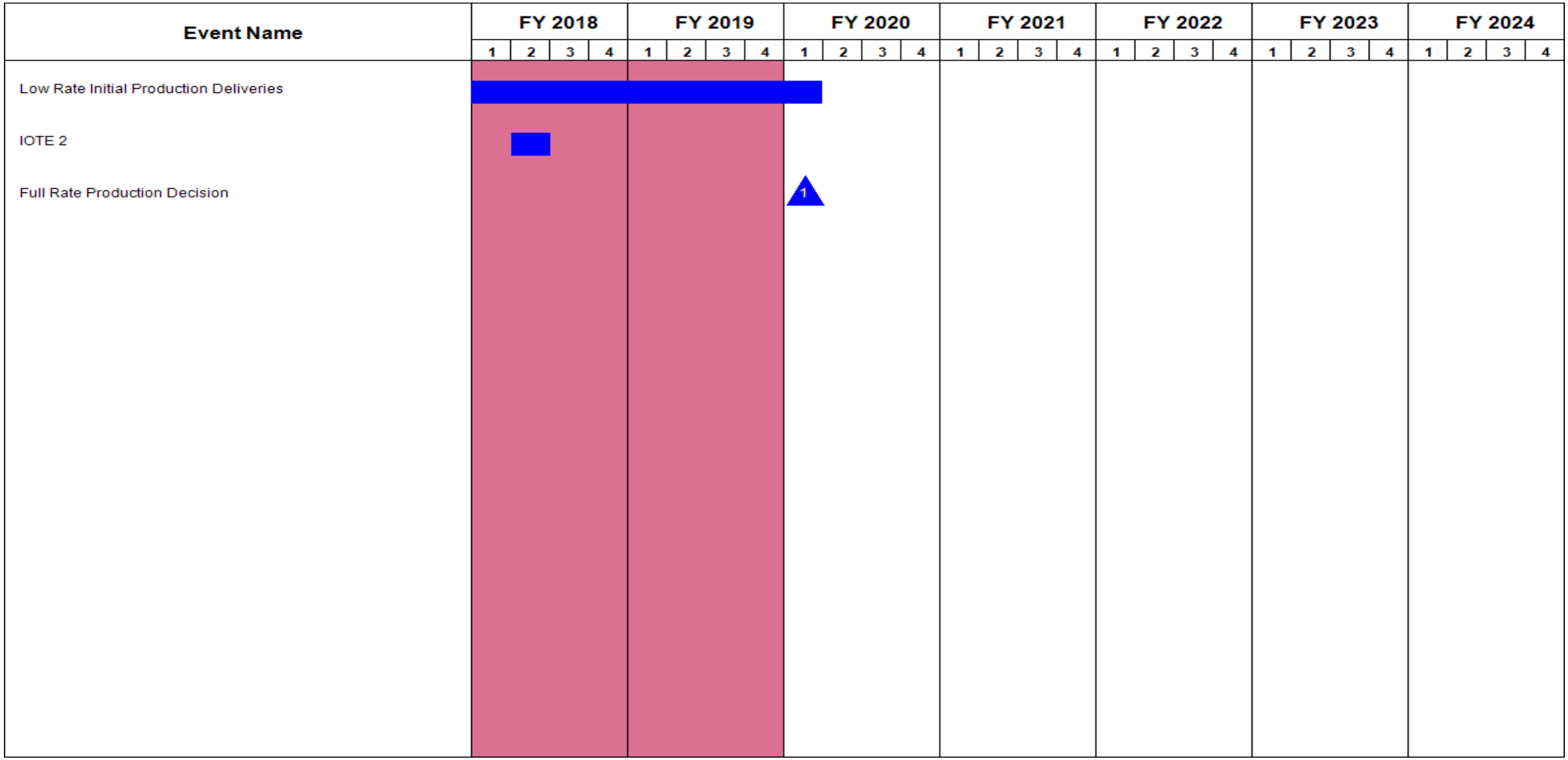

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0210609A / *Paladin Integrated Management (PIM)*	**Project (Number/Name)** ED8 / *Paladin Integrated Management (PIM)*

Schedule Details

	Start		End	
Events	**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	1	2020
Full Up System Live Fire Test	3	2015	1	2017
IOTE 2	2	2018	2	2018
Full Rate Production Decision	1	2020	1	2020
TM Verification	2	2016	1	2017
FUE Net	1	2017	2	2017
Delta TM Verification	4	2017	4	2017

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
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*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	5.631	5.721	3.936	-	3.936	3.454	3.407	3.812	3.915	0.000	29.876
RH5: *TROJAN - RH12 - MIP*	-	5.631	5.721	3.936	-	3.936	3.454	3.407	3.812	3.915	0.000	29.876

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, remotable, 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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	5.631	5.721	4.577	-	4.577
Current President's Budget	5.631	5.721	3.936	-	3.936
Total Adjustments	0.000	0.000	-0.641	-	-0.641
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-0.641	-	-0.641

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
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 2020 decrease due to economic adjustments.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
RH5: *TROJAN - RH12 - MIP*	-	5.631	5.721	3.936	-	3.936	3.454	3.407	3.812	3.915	0.000	29.876
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, remotable, 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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Integrate Direction Finding and geo-location	1.077	1.113	0.765	-	0.765
Description: Integrate Direction Finding (DF) and geolocation (GL) technologies into TROJAN Remote Receiving Groups.					
FY 2019 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. Research and test for the integration of Electronics Intelligence (ELINT) capabilities.					
FY 2020 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0303032A / *TROJAN - RH12*	**Project (Number/Name)** RH5 / *TROJAN - RH12 - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Will continuously adapt/improve the latest Direction Finding (DF) and geolocation technologies for integration into TROJAN NexGEN systems 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. Continue to research and test for the integration of Electronics Intelligence (ELINT) capabilities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding change due to economic adjustment.					
Title: Enable assured communications for the TROJAN Network architecture (formerly Improve security of the TROJAN Network architecture). ***Description:*** Acquire and apply multi-bandwidth compression algorithm technology to maximize TROJAN intelligence network throughput. ***FY 2019 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 2020 Base Plans:*** Will continue efforts that will enable communication in an anti-access/area denial environment; will continue testing with anti-jam technologies for satellite communications. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding change due to economic adjustment.	1.376	1.504	1.035	-	1.035
Title: Integrate and test specialized hardware/software ***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. ***FY 2019 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. Will continue efforts to develop TROJAN Intelligence Surveillance Reconnaissance enterprise. Will continue	1.750	1.805	1.001	-	1.001

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303032A / *TROJAN - RH12*	Project (Number/Name) RH5 / *TROJAN - RH12 - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
efforts to integrate JICD 4.2 across all platforms. Begin efforts to integrate C4ISR Modular Open Suite of Standards (CMOSS). ***FY 2020 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 JICD 4.2 and the C4ISR Modular Open Suite of Standards (CMOSS). ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding change due to economic adjustment.					
Title: Research and testing of receivers ***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. ***FY 2019 Plans:*** Continue research and testing of receiver packages for fixed and transportable TROJAN systems to acquire non-standard modulations using DSP and SDRs. Integration of receiver packages to enable additional frequency ranges for GOTS Software Defined Radios. ***FY 2020 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. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funding change due to economic adjustment.	0.255	0.524	0.360	-	0.360
Title: Labor cost software (SW) engineers ***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 2019 Plans:***	0.775	0.775	0.775	-	0.775

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0303032A / *TROJAN - RH12*	**Project (Number/Name)** RH5 / *TROJAN - RH12 - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Continue to resource labor for one MAT DEV technologist, two MAT DEV software engineers and two MAT DEV HW engineers. ***FY 2020 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 ***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.	0.375	-	-	-	-
Title: Develop specialized software enhancements to the TROJAN streaming subsystems ***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.	0.023	-	-	-	-
Accomplishments/Planned Programs Subtotals	5.631	5.721	3.936	-	3.936

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• BA0326: *TROJAN (MIP)*	40.062	27.549	17.368	1.337	18.705	18.949	18.144	15.909	16.068	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, the Acquisition Strategy leverages 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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303032A / *TROJAN - RH12*	Project (Number/Name) RH5 / *TROJAN - RH12 - MIP*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Labor Costs MAT DEV HW/SW Engineers	Various	CERDEC I2WD, APG, MD : MD	4.337	0.775	Oct 2017	0.775	Oct 2018	0.775	Oct 2019	-		0.775	0.000	6.662	-
		Subtotal	4.337	0.775		0.775		0.775		-		0.775	0.000	6.662	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integrate Direction Finding and geo-location	Various	APG : MD	4.018	1.077		1.112	Oct 2018	0.765	Oct 2019	-		0.765	Continuing	Continuing	-
Improve security of the TROJAN Network architecture	Various	APG : MD	3.275	1.376		1.505	Oct 2018	1.035	Oct 2019	-		1.035	Continuing	Continuing	-
Research and testing of Receivers	Various	APG : MD	1.641	0.255		0.524	Oct 2018	0.360	Oct 2019	-		0.360	Continuing	Continuing	-
Develop Satellite Communications (SATCOM) Dishes and transceivers	Various	APG : MD	3.269	0.375		-		-		-		-	0.000	3.644	-
Specialized Software Enhancements	Various	APG : MD	0.975	0.023		-		-		-		-	0.000	0.998	-
Develop Hardware/ Software Interface	Various	APG : MD	0.445	-		-		-		-		-	0.000	0.445	-
		Subtotal	13.623	3.106		3.141		2.160		-		2.160	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integration and Testing of Hardware/Software	Various	APG : MD	3.587	1.750		1.805	Oct 2018	1.001	Oct 2019	-		1.001	0.000	8.143	Continuing
		Subtotal	3.587	1.750		1.805		1.001		-		1.001	0.000	8.143	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0303032A / *TROJAN - RH12*	Project (Number/Name) RH5 / *TROJAN - RH12 - MIP*	

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	21.547	5.631		5.721		3.936		-		3.936	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0303032A / *TROJAN - RH12*	**Project (Number/Name)** RH5 / *TROJAN - RH12 - MIP*

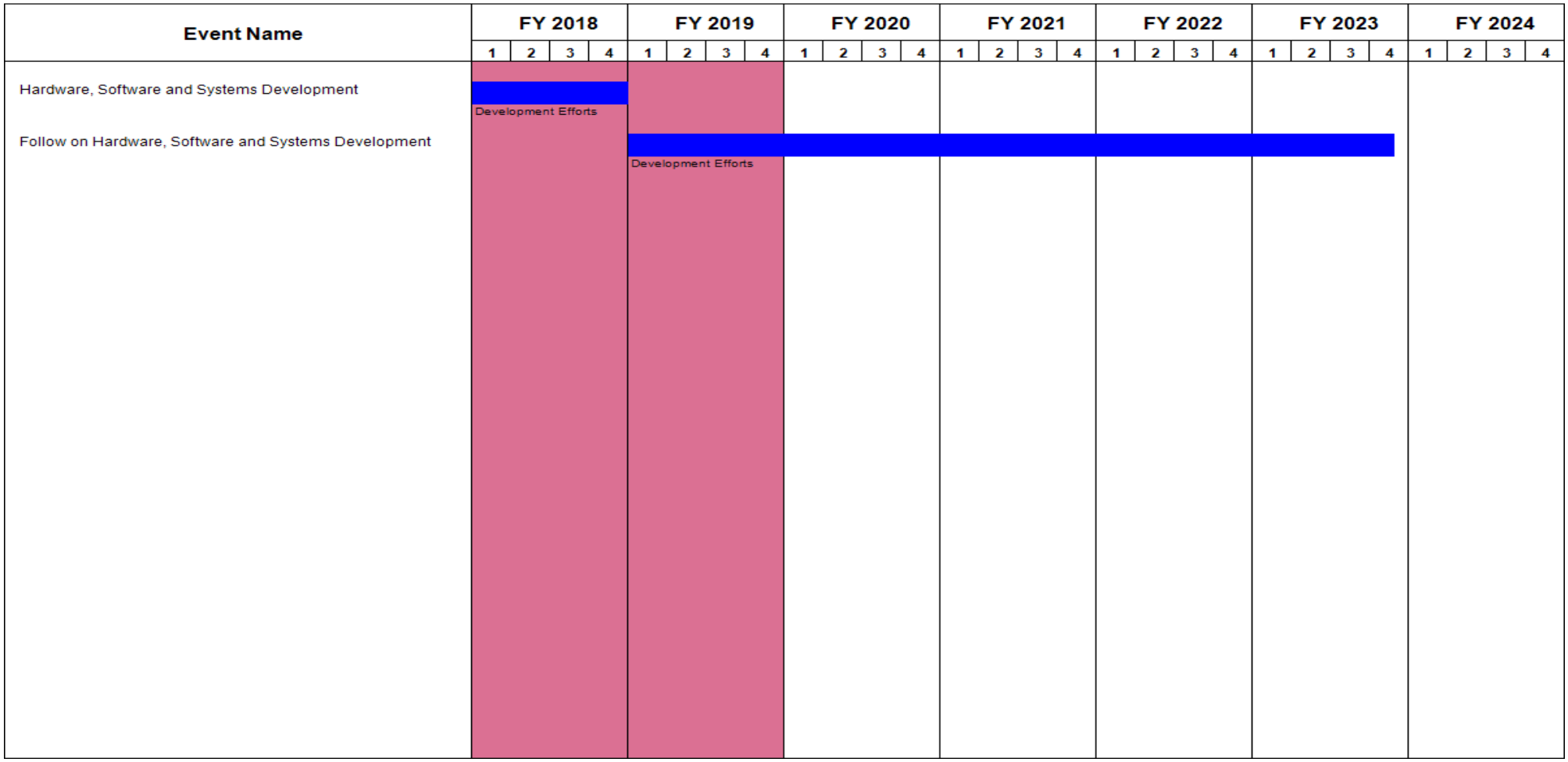

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0303032A / *TROJAN - RH12*	**Project (Number/Name)** RH5 / *TROJAN - RH12 - MIP*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Hardware, Software and Systems Development	1	2014	4	2018
Follow on Hardware, Software and Systems Development	1	2019	4	2023

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0303267A *I Auctioned Spectrum Relocation Fund*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	15.885	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.885
XR2: *Auctioned Spectrum Relocation Fund*	-	15.885	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	15.885

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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	15.885	0.000	0.000	-	0.000
Total Adjustments	15.885	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	15.885	-	-	-	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	14.616	8.922	19.675	3.200	22.875	56.417	67.971	37.954	29.321	0.000	238.076
EW5: *Electronic Warfare Development - MIP*	-	5.751	1.881	10.077	3.200	13.277	9.349	6.218	6.292	6.357	0.000	49.125
EW6: *ARAT-TSS - MIP*	-	8.865	7.041	9.598	-	9.598	10.068	10.453	10.662	10.864	0.000	67.551
FJ5: *Terrestrial Layer System (MIP)**	-	0.000	0.000	0.000	-	0.000	37.000	51.300	21.000	12.100	0.000	121.400

*This project's R-2a exhibit has been suppressed due to funding not beginning until after FY 2020

A. Mission Description and Budget Item Justification

This Program Element encompasses engineering and manufacturing development for tactical Electronic Warfare (EW) terrestrial (ground) employment applications. The systems under this program provide the Army with the capability to detect, identify, locate, collect/process, report, and engage (disrupt, degrade or deny) hostile forces to prevent their effective use of communications, counter-mortar/counter-battery radars, surveillance radars, and electronically fused munitions.

Project EW5 provides for Prophet Enhanced, 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 enabling 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).

Project EW6 provides for the Army Reprogramming Analysis Team (ARAT), 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 systems.

Project FJ5 provides for Terrestrial Layer System (TLS), a new start effort that initiates in FY 2020 and has the first year of funding in this Program Element in FY2021 to address a Signals Intelligence (SIGINT), Electronic Warfare (EW), and Cyber-enabling integrated solution to support Multi Domain Battle capability gaps and provide Force Protection, Situational Development, and Information Superiority to the maneuver forces.

Fiscal Year 2020 funds Electronic Warfare (EW) Development for Prophet Enhanced efforts (Project EW5) and the Army Reprogramming Analysis Team (ARAT) efforts (Project EW6).

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army	Date: March 2019
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0304270A *I Electronic Warfare Development*

B. Program Change Summary ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	14.616	8.922	16.142	-	16.142
Current President's Budget	14.616	8.922	19.675	3.200	22.875
Total Adjustments	0.000	0.000	3.533	3.200	6.733
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	3.533	3.200	6.733

Change Summary Explanation

$3.533 million Base is a result of $4.000M increase for Enhanced Signal Processing (ESP) kit development and integration onto Prophet Platforms (Project EW5) in support of the most recent National Defense Strategy and Near Peer Operations, and decrease of $.467 million to account for the availability of prior year execution balances.

$3.200 million OCO increase for development and integration of Theater Specific Signals of Interest (SOI) into the Prophet Enhanced system (Project EW5) in support of Army Modernization Priorities.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) EW5 / *Electronic Warfare Development - MIP*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EW5: *Electronic Warfare Development - MIP*	-	5.751	1.881	10.077	3.200	13.277	9.349	6.218	6.292	6.357	0.000	49.125
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) organic to the Brigade Combat Teams (BCTs) 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:
FY 2020 Base funding in the amount of $10.077 million will support continuing non-recurring engineering upgrades to the Prophet Enhanced Signals of Interest (SOI) baseline to support the National Defense Strategy that is Near Peer focused; funding will develop the Intelligence and Electronic Warfare Tactical Proficiency Trainer and Target Signature Arrays (IEWTPT/TSA), integrate the Enhanced Signal Processing (ESP) kit onto the Prophet Enhanced system, and continue to pursue signal of interest upgrades.

FY 2020 OCO funding in the amount of $3.200 million will support the development, integration and testing/accreditation of new, Theater Specific, signal capabilities 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 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Program Management	0.130	-	0.450	-	0.450
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 2020 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Funds will provide for matrix and contractor system engineering and program management support for the Prophet program. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increased funding in FY 2020 allows for the support of required system engineering and program management labor costs.					
Title: Upgrade to JICD 4.2 ***Description:*** JCID 4.2 will allow Theater Netcentric Geolocation (TNG) capabilities to leverage collaborative networks.	3.409	-	-	-	-
Title: 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 2019 Plans:*** Continuing development of Next Generation SIGINT capabilities to include, but not limited to upgrades to incorporate the National Intelligence Community architecture, numerous key Redhawk, X-Midas and Salvage software applications and integration of the Enhanced Signal Processing (ESP) kit into the Prophet Enhanced system. The software applications and ESP kits address signal exploitation gaps in Prophet?s ability to exploit key tactical Near Peer signals and emerging signal threats. ***FY 2020 Base Plans:*** Continuing, but not limited to development of Next Generation SIGINT capabilities into the Prophet SIGINT Software (PS2). The new signals and libraries of signals address key exploitation gaps in the Prophet system's ability to collect against key tactical near peer signals and emerging threats. ***FY 2020 OCO Plans:*** Development of, but not limited to Theater Specific Next Generation SIGINT capabilities, including Redhawk, X-Midas and Salvage software applications. ***FY 2019 to FY 2020 Increase/Decrease Statement:***	2.212	1.881	2.000	3.200	5.200

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Increased funding in FY 2020 and OCO funding allows for increased development of high priority Signals of Interest (SOI) and integration of SOI libraries, which is a more economical means of increasing the number of signals the Prophet Enhanced system can exploit.					
Title: Intelligence and Electronic Warfare Tactical Proficiency Trainer and Target Signature Arrays (IEWTPT/ TSA) ***Description:*** The Intelligence and Electronic Warfare Tactical Proficiency Trainer and Target Signature Arrays (IEWTPT/TSA) is required to conduct training to sustain operator proficiency on the Prophet Enhanced after the system has been fielded and post New Equipment Training (NET) training. ***FY 2020 Base Plans:*** Continued development of Intelligence and Electronic Warfare Tactical Proficiency Trainer and Target Signature Arrays (IEWTPT/TSA) training systems. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Both the Prophet Enhanced software and the integration readiness of IEWTPT/TSA have reached the maturity level requiring funding in FY20.	-	-	3.000	-	3.000
Title: Enhanced Signal Processing Operational Testing ***Description:*** Operational testing required after integration of the Enhanced Signal Processing kit into the Prophet Enhanced system. ***FY 2020 Base Plans:*** Funds provide for, but are not limited to release testing of the system-level Prophet System Software (PS2) to include accreditation and productization of all New Technical Insertion (TI) capabilities. The final release software version is fielded to all the Prophet Systems to upgrade capabilities against Peer Near Peer and emerging threats. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Funds not required prior to FY 2020 based on this effort being a final packaging of PS2, which is being developed through early FY 2020.	-	-	1.044	-	1.044
Title: Enhanced Signal Processing Integration & Development ***Description:*** Effort to integrate the Enhanced Signal Processing kit into the Prophet Enhanced system.	-	-	3.583	-	3.583

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
FY 2020 Base Plans: Non-recurring engineering included but not limited to integrate the Enhanced Signal Processing kit onto the Prophet Enhanced system. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** FY 2020 is the first year that the effort was resourced.					
Accomplishments/Planned Programs Subtotals	5.751	1.881	10.077	3.200	13.277

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• BZ9753: *Prophet Enhanced Modifications (MIP)*	49.093	43.847	55.052	2.051	57.103	44.602	12.150	-	-	Continuing	Continuing
• BZ9751: *SPECIAL PURPOSE SYSTEMS (MIP)*	4.241	4.162	4.000	-	4.000	4.048	4.096	4.145	4.194	Continuing	Continuing
• DX9: *National Integration To Tactical Systems(MIP)*	5.320	9.060	4.490	-	4.490	4.223	5.183	4.425	4.537	Continuing	Continuing
• 0604021A: *Electronic Warfare Technology Maturation (MIP)*	-	-	18.043	-	18.043	18.800	-	-	-	0.000	36.843

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 maintain SIGINT relevance and complete Technical Insertion (TI) to Prophet Enhanced systems to pursue the latest Signals of Interest and design against obsolescence. The Technical Insertion (TI) contract supports R&D and other developmental work.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) EW5 / *Electronic Warfare Development - MIP*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	PM Electronic Warfare & Cyber : APG, MD	1.481	0.130	Jan 2018	-		0.450	Dec 2019	-		0.450	Continuing	Continuing	Continuing
		Subtotal	1.481	0.130		-		0.450		-		0.450	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Upgrade to JICD 4.2	SS/CPFF	GD Mission Systems : Scottsdale, AZ	-	3.409	Jan 2018	-		-		-		-	Continuing	Continuing	Continuing
Signals of Interst Upgrade	SS/CPFF	GD Mission Systems : Scottsdale, AZ	-	2.212	Jan 2018	1.881	Jan 2019	2.000	Jan 2020	3.200	Jul 2020	5.200	Continuing	Continuing	Continuing
IEWTPT/TSA	SS/CPFF	GD Mission Systems : Scottsdale, AZ	-	-		-		3.000	Jan 2020	-		3.000	0.000	3.000	-
Enhanced Signal Processing Integration & Development	SS/CPFF	GD Mission Systems : Scottsdale, AZ	-	-		-		3.583	Jan 2020	-		3.583	Continuing	Continuing	Continuing
		Subtotal	-	5.621		1.881		8.583		3.200		11.783	Continuing	Continuing	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Enhanced Signal Processing Operational Testing	MIPR	Army Test & Evaluation Command : Ft. Huachuca, AZ	-	-		-		1.044	Mar 2020	-		1.044	0.000	1.044	-
		Subtotal	-	-		-		1.044		-		1.044	0.000	1.044	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
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	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1.481	5.751		1.881		10.077		3.200		13.277	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW5 / *Electronic Warfare Development - MIP*

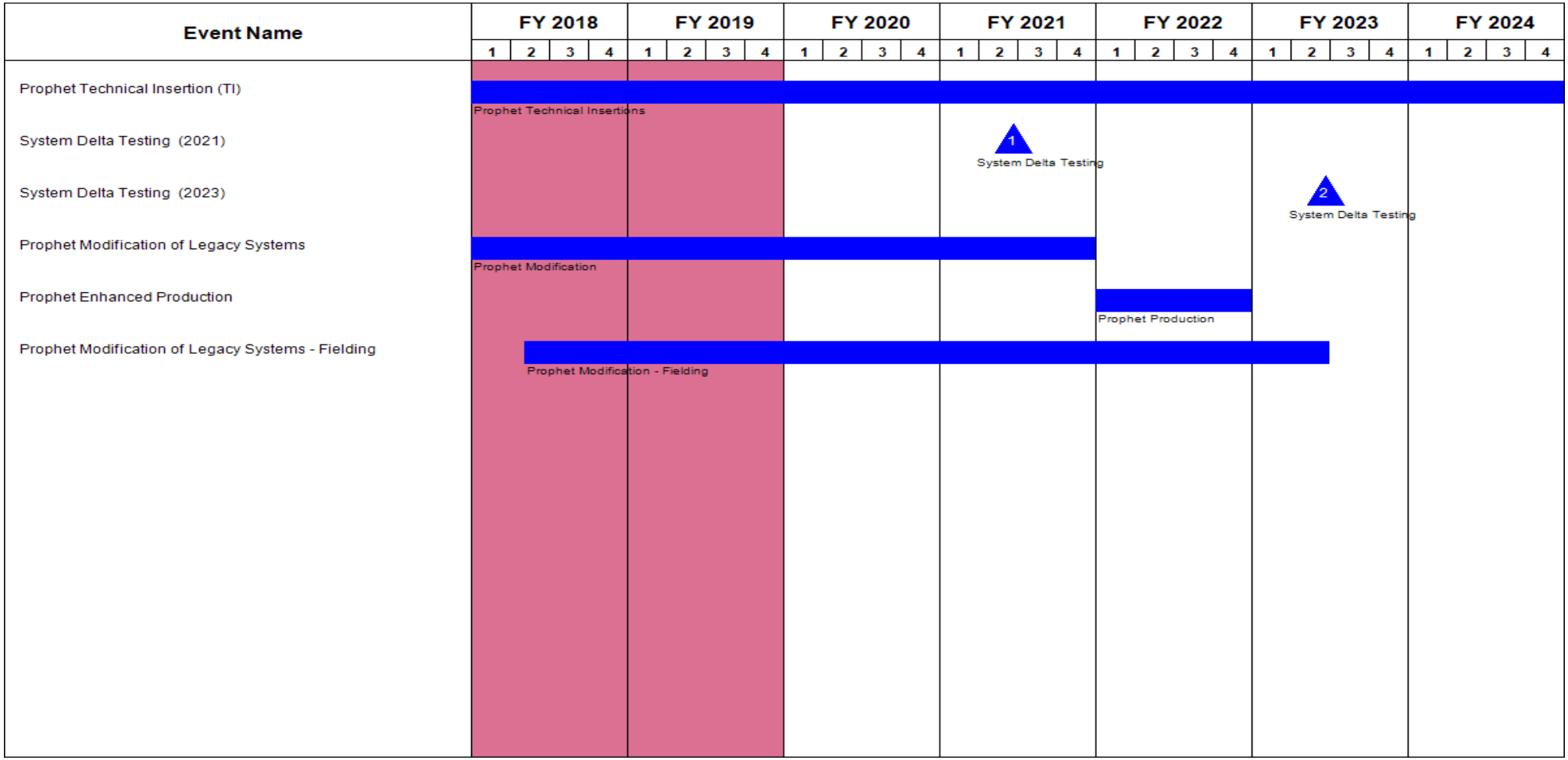

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW5 / *Electronic Warfare Development - MIP*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Prophet Technical Insertion (TI)	4	2008	4	2024
System Delta Testing (2021)	2	2021	2	2021
System Delta Testing (2023)	2	2023	2	2023
Prophet Modification of Legacy Systems	3	2017	4	2021
Prophet Enhanced Production	1	2022	4	2022
Prophet Modification of Legacy Systems - Fielding	2	2018	2	2023

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) EW6 / *ARAT-TSS - MIP*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
EW6: *ARAT-TSS - MIP*	-	8.865	7.041	9.598	-	9.598	10.068	10.453	10.662	10.864	0.000	67.551
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) Force Protection Systems (FPS) 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 Signal threats to US Forces. The ARAT mission software 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 worldwide threat signature changes which affect EW systems; determines the impact of observed Signal Intelligence (SIGINT) signature changes; rapidly develops new mission software to adapt friendly systems to detect and defeat enemy threats to U.S. Army ground and air platforms; disseminates the Mission Software and Products to forward deployed forces, and provides 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.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Keeping Pace with the Enemy and Technology	4.872	3.722	5.972	-	5.972
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, hardware modernization, 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, test and distribute mission software solutions for forward deployed combat forces. ***FY 2019 Plans:*** This FY effort will capitalize on accomplishments in FY 2018 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. ***FY 2020 Base Plans:*** ARAT's FY 2020 plan will continue to focus on the rapid development, testing, and distribution of mission software for regions worldwide. In support of Air Mission software development, ARAT will continue automating threat simulation development, Radio Frequency automated signal generation, automating threat analysis tools, developing a universal mission software generation tool, and software hardening capability. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** ARAT has increased from FY 2019 to FY 2020 due to increased emphasis on automation of threat simulations development and threat analysis tools.					
Title: Infrastructure Improvements Multispectral	1.637	1.104	1.306	-	1.306
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 that detect and counter MANPADS to defend Army Aviation platforms against this lethal threat. ***FY 2019 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					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
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 2020 Base Plans:*** ARAT will continue to enhance Multispectral Mission Software development, testing, and distribution infrastructure. ARAT will continue modernization of the multispectral software development environment as well as automation of threat analysis tools and multispectral simulation capabilities. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** There is only a slight increase from FY 2019 to FY 2020. The increase is attributed to slightly higher costing expected on the various planned efforts.					
Title: Infrastructure Improvement Radio Frequency General ***Description:*** This effort focuses on enhancing the Army's Radio Frequency (RF) EW system Mission Software and Products (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 2019 Plans:*** 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 2020 Base Plans:*** In support of Ground Electronic Warfare Radio Frequency Mission Software development, ARAT will develop modernization efforts for the automated testing of mission software, develop laboratory environmental models that replicate actual physical and climatic environments worldwide, and optimize threat automation tools. Additionally, ARAT will create a software tool that will control various versions of Radio Frequency (RF) simulators and RF Signal Generators. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** There is only a slight increase from FY 2019 to FY 2020. The increase is attributed to slightly higher costing expected on the various planned efforts.	1.538	1.349	1.469	-	1.469
Title: Threat Flagging and Mission Data Set Reprogramming Tool Development	0.818	0.866	0.851	-	0.851

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Description: This effort focuses on enhancing the Army's capability to monitor changes in enemy EW systems that affect system performance of Army detection, declaration, and countermeasure EW systems onboard. 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 counters the threat. This effort will enhance the Army's capability bridge detection of a change in enemy threat and the rapid development of MSP. ***FY 2019 Plans:*** 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. ***FY 2020 Base Plans:*** ARAT will continue the design and development of the modernized Threat Change Detection (TCD) tool. This tool will provide the enhanced ability for the Army to rapidly detect and analyze National level captured signal intelligence parametric data. The TCD tool will utilize analytical tools to assess the change in threat emitters and to prioritize the lethality of a threat change and its impact to US Forces. Additionally, ARAT will continue with modernization efforts of the mission software generation tools and hardware infrastructure. Planned FY 2020 effort will include the creation of a Universal Mission Data Set Generation (UMG) tool. The UMG tool will consolidate the current multiple Mission Data Set Generation tools into a single tool. The benefit of a single tool will enhance the Mission Software development process by reducing the sustainment of 5 Generation tools into a single Generation tool. ***FY 2019 to FY 2020 Increase/Decrease Statement:*** There is only a slight decrease from FY 2019 to FY 2020. The decrease is attributed to lower costing expected on the various planned efforts.					
Accomplishments/Planned Programs Subtotals	8.865	7.041	9.598	-	9.598

Exhibit R-2A, RDT&E Project Justification: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

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

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Army			Date: March 2019
Appropriation/Budget Activity 2040 / 5	R-1 Program Element (Number/Name) PE 0304270A / *Electronic Warfare Development*	Project (Number/Name) EW6 / *ARAT-TSS - MIP*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	Various	CECOM SEC : Aberdeen Proving Ground, MD	0.522	8.865		0.161		0.182	Mar 2020	-		0.182	Continuing	Continuing	Continuing
		Subtotal	0.522	8.865		0.161		0.182		-		0.182	Continuing	Continuing	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
USG Labor	Various	CECOM SEC : Various Locations	3.111	-		0.372		0.383		-		0.383	0.000	3.866	-
Travel	Various	CECOM SEC : Various Locations	0.838	-		0.080		0.084		-		0.084	0.000	1.002	-
		Subtotal	3.949	-		0.452		0.467		-		0.467	0.000	4.868	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Development Support	Various	CECOM SEC, RDECOM, DTIC : Various Locations	34.726	-		6.428		8.949	Mar 2020	-		8.949	Continuing	Continuing	Continuing
		Subtotal	34.726	-		6.428		8.949		-		8.949	Continuing	Continuing	N/A

	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	39.197	8.865		7.041		9.598		-		9.598	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

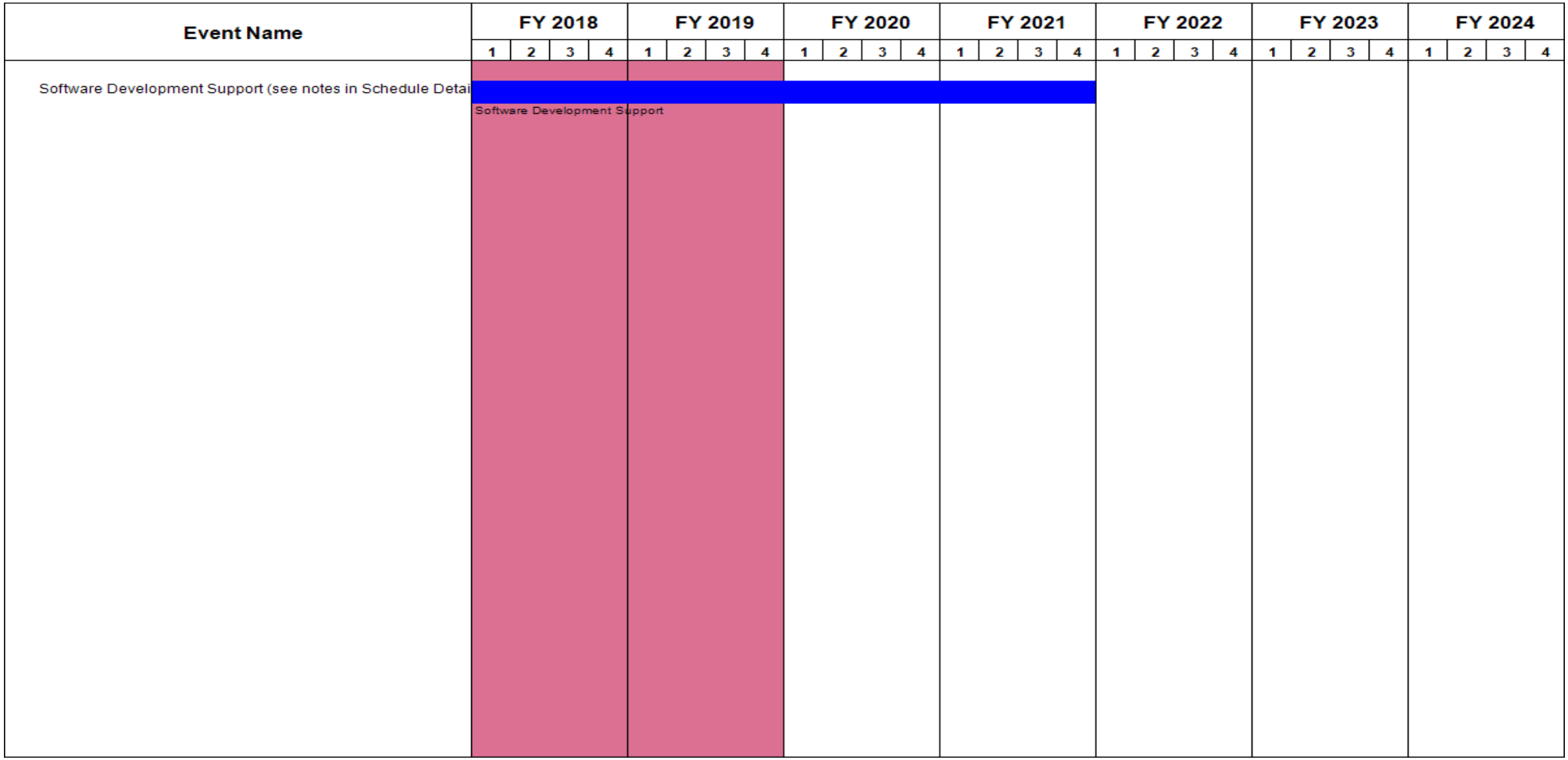

Exhibit R-4A, RDT&E Schedule Details: PB 2020 Army		Date: March 2019
Appropriation/Budget Activity 2040 / 5	**R-1 Program Element (Number/Name)** PE 0304270A / *Electronic Warfare Development*	**Project (Number/Name)** EW6 / *ARAT-TSS - MIP*

Schedule Details

	Start		End	
Events	**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

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Army											Date: March 2019	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 1205117A / *Tractor Bears*							
COST ($ in Millions)	**Prior Years**	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**Cost To Complete**	**Total Cost**
Total Program Element	-	17.928	23.170	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	41.098
FG3: *Tractor Bears*	-	17.928	23.170	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	41.098

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)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	17.928	23.170	54.551	-	54.551
Current President's Budget	17.928	23.170	0.000	-	0.000
Total Adjustments	0.000	0.000	-54.551	-	-54.551
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	-54.551	-	-54.551

Change Summary Explanation

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